The Missouri
Nonpoint Source Management Program
Annual Progress Report
For Federal Fiscal Year FFY2013

MISSOURI
DEPARTMENT
OF NATURAL
RESOURCES

Prepared by the Missouri Department of Natural Resources
Division of Environmental Quality
Water Protection Program, Watershed Protection Section, Nonpoint Source Unit

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December 11, 2013

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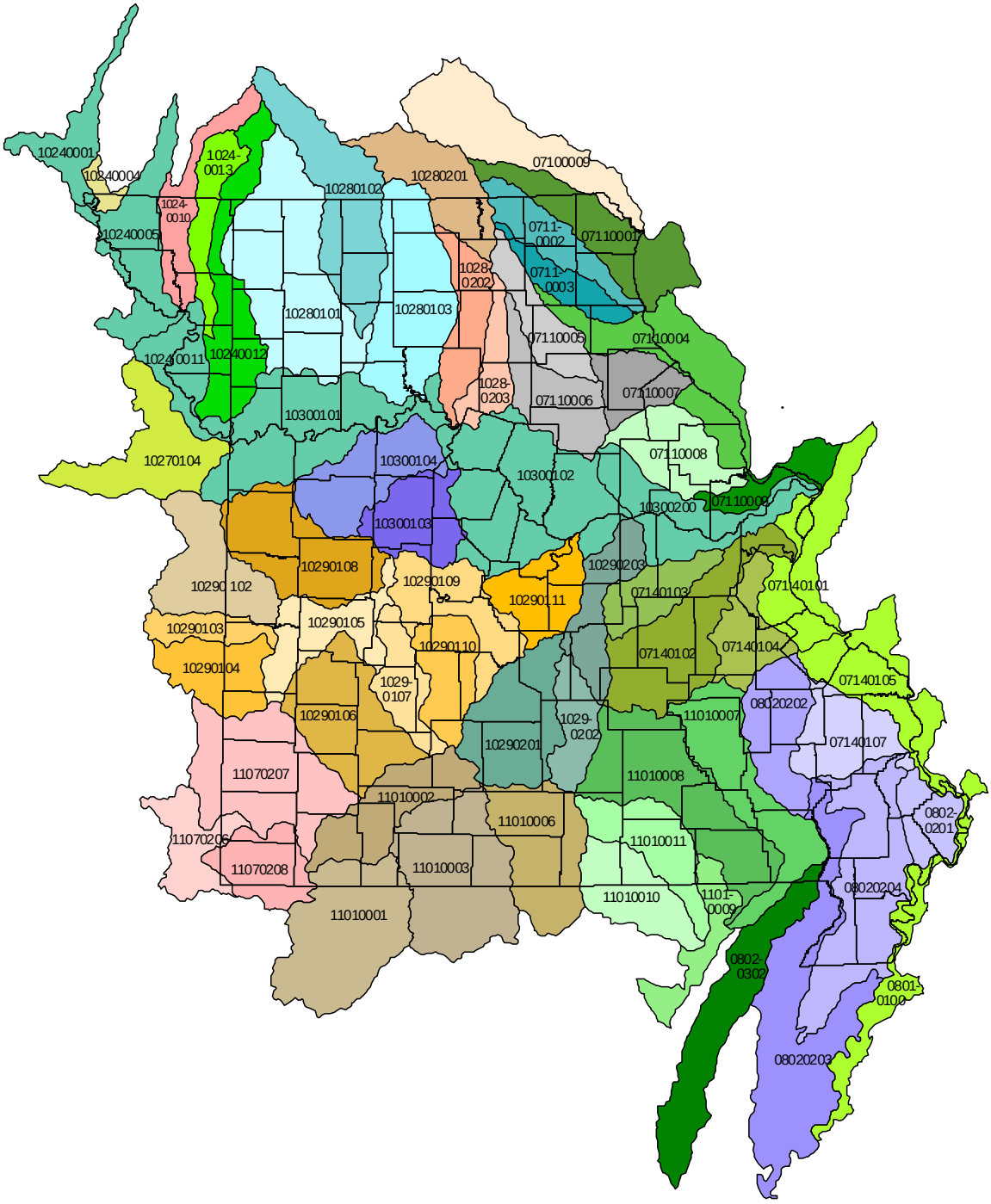
Missouri Hydrologic Unit Delineations by 8-digit Hydrologic Unit Code (HUC).
(Overview)



Missouri Watersheds: HUC 8, USGS Basin Name, and Missouri Basin Name (Overview map supplement)

HUC 8	USGS Basin Name	Missouri Basin Name
07100009	Lower Des Moines	Des Moines Basin
07110001	Bear-Wyaconda	Wyaconda - Fox Rivers
07110002	North Fabius	North Fabius River Basin
07110003	South Fabius	South Fabius River Basin
07110004	The Sny	North River - Bobs Creek
07110005	North Fork Salt	North Salt River Basin
07110006	South Fork Salt	Middle-South Forks of the Salt River
07110007	Salt	Lower Salt River Basin
07110008	Cuivre	Cuivre River Basin
07110009	Peruque-Piasa	Peruque-Dardenne Creeks
07140101	Cahokia-Joachim	Mississippi River Tribs - St. L-Ste. Gen
07140102	Meramec	Meramec River Basin
07140103	Bourbeuse	Bourbeuse River Basin
07140104	Big	Big River Basin
07140105	Upper Mississippi-Cape Girardeau	Mississippi River Tribs - Ste. Gen-Cape Gir.
07140107	Whitewater	Castor-Whitewater Rivers Basin
08010100	Lower Mississippi-Memphis	Mississippi River Mainstem Below Ohio River
08020201	New Madrid-St. Johns	St. Johns Bayou
08020202	Upper St. Francis	Upper St. Francis Basin
08020203	Lower St. Francis	Lower St. Francis Basin
08020204	Little River Ditches	Little River Ditches
08020302	Cache	Cache River Basin
10240001	Keg-Weeping Water	Missouri River Bottom
10240004	Nishnabotna	Nishnabotna River Basin
10240005	Tarkio-Wolf	Tarkio-Squaw Tributaries Basin
10240010	Nodaway	Nodaway River Basin
10240011	Independence-Sugar	Missouri River Mainstem
10240012	Platte	Platte River Basin
10240013	One Hundred and Two	102 River Basin
10270104	Lower Kansas	Kansas River Basin
10280101	Upper Grand	Upper Grand River Basin
10280102	Thompson	Thompson River Basin
10280103	Lower Grand	Middle Grand River Basin
10280201	Upper Chariton	Upper Chariton River Basin
10280202	Lower Chariton	Lower Chariton River Basin
10280203	Little Chariton	Little Chariton River Basin
10290102	Lower Marais Des Cygnes	Maries des Cygnes River Basin
10290103	Little Osage	Little Osage River Basin
10290104	Marmaton	Marmaton River Basin

HUC 8	USGS Basin Name	Missouri Basin Name
10290105	Harry S. Truman Reservoir	Upper Osage River Basin
10290106	Sac	Sac River Basin
10290107	Pomme De Terre	Pomme de Terre River Basin
10290108	South Grand	South Grand River Basin
10290109	Lake of the Ozarks	Lake of Ozarks Basin
10290110	Niangua	Niangua River Basin
10290111	Lower Osage	Lower Osage River Basin
10290201	Upper Gasconade	Upper Gasconade River Basin
10290202	Big Piney	Big Piney River Basin
10290203	Lower Gasconade	Lower Gasconade River Basin
10300101	Lower Missouri-Crooked	Missouri River Mainstem - KC to Glasgow
10300102	Lower Missouri-Moreau	Missouri River Mainstem - Glasgow to Hermann
10300103	Lamine	Lamine River Basin
10300104	Blackwater	Blackwater River Basin
10300200	Lower Missouri	Missouri River Mainstem - Hermann to St. Louis
11010001	Beaver Reservoir	Table Rock Lake Basin
11010002	James	James River Basin
11010003	Bull Shoals Lake	Bull Shoals Lake Basin
11010006	North Fork White	North Fork White River Basin
11010007	Upper Black	Black River Basin
11010008	Current	Current River Basin
11010009	Lower Black	Fourche Creek Basin
11010010	Spring	Spring River Basin (Howell/Oregon counties)
11010011	Eleven Point	Eleven Point River Basin
11070206	Lake O’ the Cherokees	Cherokees Lake Basin
11070207	Spring	Spring River Basin
11070208	Elk	Elk River Basin

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I. Missouri's Nonpoint Source Management Program

A. Mission Statement

The mission of Missouri's Nonpoint Source Management Program (the program, or NPSMP) is to preserve and protect the quality of the water resources of the state from nonpoint source impairments.

Goal A: Water Quality Assessment, Monitoring and Prioritization
Continue and enhance statewide water quality assessment processes to evaluate water quality and prioritize watersheds affected by nonpoint source (NPS) pollution.

Goal B: Water Quality Improvement and Protection
Improve water quality by implementing NPS-related projects and other activities.

Goal C: **State Nonpoint Source Program Management**
Maintain a viable, relevant, and effective program with the flexibility necessary to meet changing environmental conditions and regulations.

Nonpoint source pollution occurs when water runs over land or through the ground, picks up natural or man-made pollutants, and deposits them in surface waters or ground water. As stated above, the mission of the NPSMP is to preserve and protect the quality of Missouri's water resources from nonpoint source impairments. Fulfilling the water quality protection mission of the program can only be accomplished with the cooperation of other resource agencies and the citizens of the state. As administrator of the program, the Missouri Department of Natural Resources and its partners continue to make progress in the protection of water, as well as air and land resources.

This document reports the accomplishments and impacts being made by the Department and its partners in the control and abatement of nonpoint source pollution through the 319-grant program and collaborative efforts in the State of Missouri during the Federal Fiscal Year 2013 (October 1, 2012 through September 30, 2013).

B. Missouri's Key NPS Program Elements

The following elements provide the framework for Missouri's current NPSMP. Missouri's approach is outlined beginning on page 20 of the Missouri Nonpoint Source Management Plan found at http://www.dnr.mo.gov/env/wpp/nps/mgmtplan/index.html. These eight key elements of an effective program are used to determine current program progress, development areas and, most importantly, successes of the program.

1. The state program contains explicit short and long-term goals, objectives, and strategies to protect surface and ground water.

2. The state strengthens its working partnerships and linkages to appropriate state, interstate, tribal, regional and local entities (including conservation districts), private sector groups, citizen groups, and federal agencies.

3. The state uses a balanced approach that emphasizes both statewide programs and on-the-ground management of individual watersheds where waters are impaired or threatened.

4. The state program (a) abates known water quality impairments from NPS pollution and (b) prevents significant threats to water quality from present and future NPS activities.

5. The state program identifies waters and their watersheds impaired by NPS pollution and identify important unimpaired waters that are threatened or otherwise at risk. Further, the state establishes a process to progressively address these identified waters by conducting more detailed watershed assessments and developing watershed implementation or management plans, and then implementing the plans.

6. The state reviews, upgrades, and implements all program components required by section 319(b) of the Clean Water Act, and establishes flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable. The state programs include:

    - A mix of water quality-based and/or technology-based programs designed to achieve and maintain beneficial uses of water; and

    - A mix of regulatory, non-regulatory, financial, and technical assistance as needed to achieve and maintain beneficial uses of water as expeditiously as practicable.

7. The state identifies federal lands and activities, which are not managed consistently with state program objectives. Where appropriate, the state seeks EPA assistance to help resolve issues.

8. The state manages and implements its program efficiently and effectively, including necessary financial management.

9. The state periodically reviews and evaluates its program using environmental and functional measures of success and revises its NPS assessment and its program at least every five years.

II. 319 NPS Source Grant Program Overview

A. Missouri Section 319(h) Nonpoint Source Management Grants

NPS grant funds are provided from EPA through Section 319(h) of the Clean Water Act. Funds are used to address nonpoint sources of pollution and are administered from EPA through the Department to eligible pass-through recipients and for NPS program administration. Funds can be used to address NPS pollution through information/education, water quality monitoring, demonstrations, and implementation of practices that preserve, conserve, restore, or improve water quality. Eligible recipients of pass-through funds include state and local agencies, educational institutions, and non-profit organizations. The Department may award pass-through grant funds to eligible recipients noncompetitively or through a request for proposals (RFP) describing the grant opportunity. Since 2009, a portion of 319 funds have been utilized through the Department's Performance Partnership Grant (PPG).

B. Priorities and Project Selection Process

This is the second year of a transition in NPS program philosophy. Technically speaking, the 2005 version of the NPSMP is the current approved program. However, during 2013, Missouri dramatically narrowed the scope of their program and reformed several processes related to grant award allocations and subaward project selection. Competitive and non-competitive award of Section 319 funding still emphasizes projects that restore the quality of waters on the state's 303(d) list due to nonpoint sources. However, other high quality NPS projects are also highly encouraged; including those with alternative implementation plans, projects with high success potential such as those related to the Department's Our Missouri Waters (OMW) watershed initiative, and state priority protection efforts in waters that are not impaired. Funding is assigned to eligible projects addressing agricultural, urban, and abandoned mine land; especially those that will benefit aquatic life use.

To manage priorities, three types of subgrants were offered in FFY2013: major subgrants, minigrants, and watershed planning subgrants. Funding limitations relating to availability of base funding and incremental fund eligibility impacted the solicitation and award amounts available for minigrants and watershed planning grants. Specifically, only older grants had base funding available for minigrants and the allocation of funds for watershed planning was temporarily depleted until a new allocation could be added. Specific subgrant awards for 2013 are provided later in Section III in Tables 10 and 11.

Potential applicants were provided discussion opportunities at the Water Protection Forum and Water Quality Coordinating Committee Meetings. Assistance from the Department was

also provided via telephone and email through July 19, 2013, and conference calls were held for potential applicants on May 30 and June 26, 2013. The project focus areas in the RFP included NPS concerns associated with streams, dams and stormwater in OMW areas, those with acceptable watershed based plans, or other high quality projects showing good potential for positive NPS impacts. Applications were due by the close of business on July 30, 2013.

Minigrants have been an effective part of Missouri's NPS program since 1997. Over the years various changes have taken place relating to award amounts, project periods, priorities, and frequency of acceptance. In 2013, due to funding limitations applications were accepted by special arrangement only. These projects awards were $10,000 or less and lasted up to 24 months. Minigrants are traditionally educational or outreach oriented, occurring in various watersheds or other geographic regions throughout the state and are seldom eligible for incremental funding. Availability of base (program) funding is limited because these funds were placed in the PPG. Minigrants are still accepted by special arrangement with the Department. Considering staff reductions and the amount of time required to manage these small awards, the Department may move toward a more direct minigrant solicitation process or provide noncompetitive awards intended to support other high priority watershed efforts. Minigrant applications are reviewed, prioritized, and rated by an in-house review committee and recommendations for funding provided to the Department. In FFY2013, two new minigrants were awarded for a total of approximately $20,000.

Watershed Management Planning Subgrants were also available for special arrangement in FFY2013 for producing nine-element watershed plans in watersheds with 303(d) listed NPS impairments. As part of new EPA guidance and Missouri's program reform, the quality of Missouri's existing watershed based plans (previously called watershed management plans) was scrutinized in 2013. Staff considered the cumulative total of existing watershed plans, their completeness, and stage of implementation, age, activity location, and adequacy. The group concluded that planning has exceeded effective implementation efforts and many plans are out of date, detail, or do not have adequate implementation schedules. As a result, a new watershed based planning process is being evaluated that will help ensure strong diverse partnerships, adequate technical expertise, and achievable and trackable implementation success. A pilot effort began in 2013 partnering the Department with Kansas State University, University of Missouri Extension, and the Harry S. Truman Coordinating Council. The cost is approximately $80,000 for a Hydrologic Unit Code (HUC) 8 based plan that will target problematic HUC 12 watersheds; then break those down to a catchment scale to identify critical areas within each problematic HUC 12.

EPA traditionally allowed the use of incremental funding to support Missouri's watershed planning subgrant effort. A distinct funding pool was created and specific amounts were allocated to that pool from several grants for planning purposes. During FFY2013, funds allocated for watershed based planning was reestablished.

C. Measuring Benefits of the Section 319(h) Nonpoint Source Management Grant Program

In 2013, NPS 319 grants have accomplished noteworthy results in the control and mitigation of NPS pollution in the state of Missouri. By focusing funding on water quality information

and education, outreach, implementation of practices, and remediation of existing water quality problems, 319 grant funding has proven to be a valuable resource to the citizens of Missouri.

Water bodies achieve water quality standards through education and active management practices. The 319 NPS Management Program strives to provide Missouri citizens with choices, tools, and decision-making skills that will benefit water quality through education in the use and protection of natural resources and through implementation of best management practices (BMP). BMPs are used to control the production or delivery of pollutants from agricultural, mining, and urban activities to water resources, and to prevent decline of the physical and biological integrity of surface and ground water. BMPs can be either structural or managerial.

Structural BMPs include physical structures or materials that are used to protect water quality and slow water velocities to prevent soil erosion. Some examples are animal waste facilities, wetlands basins, silt fences, check dams, water diversions, and grade stabilization.

Managerial BMPs address how projects are implemented; primarily the method of carrying out a project. Examples of managerial BMPs include nutrient and pest management, rotational grazing, conservation tillage, street sweeping, use of native plants, and practices that minimize or prevent soil erosion. It can be difficult to quantify the benefits of managerial BMPs because they are often represented by philosophical changes among land managers.

BMPs promote sustainability and may be reproduced to achieve comparable results in other locations. Some BMPs are founded in research that identifies potential for measured reductions in pollution that will be achieved through use of the practice.

Missouri's NPSMP, Goal B, specifies that the state will "Improve water quality by implementing NPS-related projects and other activities." Water quality benefits are often difficult to quantify and BMP implementation can take a considerable period of time before improvements to water quality can be measured. In Section II.C.2., the Department has estimated the number of BMPs implemented as a direct result of 319 NPS grants for 2013. Load reductions data collection is not all-inclusive, as not all projects are required to report, but it does indicate that the 319 NPS Program is having a noteworthy, positive impact on the state's water quality.

As indicated in Missouri's key elements, a successful NPS program identifies nonpoint sources and causes of water quality impairments; but an effective watershed-based approach considers both non-regulatory and regulatory concerns. As pollution sources are identified and prioritized within the watershed, management and conservation practices can be planned, scheduled and implemented. To measure success, these NPS activities are strongly dependent upon water quality permitting of point sources to identify and help quantify loading from nonpoint sources. Consequently, current National Pollutant Discharge Elimination System (NPDES) permit incidences for FFY 2013 by HUC are tabulated below in Table 1.

Table 1. NPDES Permit Instance by HUC*

HUC 8	Permits	HUC 8	Permits	HUC 8	Permits	HUC 8	Permits	HUC 8	Permits
07100009	8	07140105	249	10240013	88	10290108	364	11010003	345
07110001	75	07140107	180	10270104	14	10290109	664	11010006	29
07110002	62	08010100	24	10280101	207	10290110	173	11010007	171
07110003	42	08020201	91	10280102	71	10290111	138	11010008	74
07110004	199	08020202	153	10280103	130	10290201	218	11010009	2
07110005	71	08020203	73	10280201	31	10290202	106	11010010	61
07110006	185	08020204	226	10280202	59	10290203	93	11010011	47
07110007	91	08020302	3	10280203	87	10300101	1168	11070206	24
07110008	261	10240001	1	10290102	38	10300102	1116	11070207	661
07110009	322	10240004	5	10290103	9	10300103	229	11070208	173
07140101	471	10240005	73	10290104	45	10300104	244	Unassigned	2449
07140102	478	10240010	29	10290105	79	10300200	540	**TOTAL**	**15,604**
07140103	201	10240011	272	10290106	245	11010001	271		
07140104	213	10240012	216	10290107	114	11010002	753		

***Comment**
This report only contains permit "issuance" counts for effective and expired permits (i.e., active permits). Terminated permits are not included.

1. Pass-through NPS Projects in FFY 2013

Missouri's NPS program staff managed fifty two (52) projects during FFY2013. As acknowledged by EPA Headquarters and Region 7, some project successes are not easily captured using the Grant Reporting and Tracking System (GRTS) and EPA's strategic plan measure, WQ10 Success Stories. To better demonstrate successful efforts, water quality improvements and appropriate use of grant funds, this report includes in Appendix A, brief summaries of all active NPS water quality projects during FFY13.

The project summaries in Appendix A convey more encompassing portrayal Missouri's pass-through projects than previous annual progress reports. Executive summaries of the active projects allows the reader a better understanding of the grant recipients, their intent, scope of work, and achievements that are not readily captured using traditional progress reporting methods. With a new NPSMP, Missouri will explore and enact additional innovative and cost effective measures of water quality improvement and success with the support of EPA Region 7.

2. Summary of FY13 Project Evaluation Measures

The data contained in tables 2 through 6 was compiled from information submitted by 319 subgrant project sponsors and reflects the activities conducted as part of their projects during this reporting period. Project sponsors reported these project activities and load reductions on a statewide, regional, or HUC 8 basis. Table 2, on the following page, entitled "Summary of FFY13 319 NPS Project Evaluation Measures: All Activities," represents a summary of results for all 319-related project activities in FFY13. Table 3, titled "Summary of FFY13 319 NPS Project Evaluation Measures: Statewide," shows only projects that reported

statewide achievements and were not designated to a specific watershed level or specific HUC 8. Table 4, titled "Summary of FFY13 319 NPS Projects Evaluation Measures: Regional," shows only projects that reported achievements on a regional basis (multiple HUCs or county(ies) as opposed to statewide or by individual HUC. These projects impacted more than one HUC. Table 5, titled "Summary of FFY13 319 NPS Projects Evaluation Measures: 8-digit HUC Summary," provides a summary of achievements at watershed (HUC) levels. Bar charts in Table 6 display number of practices, acres impacted and cumulative reductions in sediment, nitrogen and phosphorus.

Table 2. Summary of FFY13 319 NPS Project Evaluation Measures: All Activities

Summary of All Data for FFY13 319 NPS Project Evaluation Measures

Year	2013	All Data

Activities									
Planning		Groups Formed	Meetings Held	Ave Attendees	Planning Documents Produced	Watershed Mgmt Plans W/ 9-elements	Watershed Mgmt Plans W/out 9-elements	Source Water Protection Plans Written	Other Plans
Totals		24	167	295	32	4	0	0	28
						Acres	Acres	Acres	Acres
						134951	0	0	24483

Total Maximum Daily Loads		TMDL Action Plans Written	TMDL Action Plans Implemented	BMP's Applied Toward TMDL's	TMDL Acres Treated	Stream Miles in compliance	Lake acres in Compliance
Totals		11	12	23	581	0	0

Education/Information		Field Days	Field Day Participants	Workshops	Workshop Participants	Demonstration Sites	Demonstration Site Participants	Brochures, Curriculums, and Factsheets Developed	Brochures, Curriculums, and Factsheets Distributed	GIS Maps/Shape Files Developed	Interactive Maps Created
Totals		135	26616	127	5905	73	852	0	0	161	83

Education/Information		PSA's Produced	PSA's Aired	Newsletters Developed	Newsletters Distributed	Webpages Produced	Webpage Views	Clean-Up Events Conducted	Clean-Up Event Participants	Tons Collected at Clean-Up Events
Totals		19	503	78	168877	140	83123	28	784	27

Water Quality Monitoring		QAPPs Produced	QAPP's Revised	Stream Teams Formed	Training Sessions Conducted	Volunteers Trained	Sampling Locations Monitored	Sampling Events Conducted	Water Quality Parameters Analyzed
Totals		1	6	12	19	396	311	1561	177

Groundwater Protection		Wells Plugged	Wells Monitored	Sinkhole/Karst Protection	Groundwater Remediation
Totals		1164	1	0	0

Best Management Practices		BMP's Implemented	Acres Impacted by BMP's	Tons of Sediment Saved	Lbs. Nitrogen Reduced	Lbs. Phosphorus Reduced	Lbs. Pesticides Reduced	Other Load Reductions
Totals		305	26212	2041	7364	3792	0	4669

Agricultural		CNMP Developed	CNMP's Updated	CNMP's Implemented	Acres Impacted by CNMP's	Animals Impacted by CNMP's	Animal Waste Facilities Built	Ilbs of Manure Transferred Out
Totals		0	0	0	0	0	0	0

Table 3. Summary of FFY13 319 NPS Project Evaluation Measures: Statewide

Summary of All Statewide 319 NPS Project Evaluation Measures for FFY13

Year	2013
Statewide	

Activities									
Planning		Groups Formed	Meetings Held	Total Cummulative Ave	Planning Documents Produced	Watershed Mgmt Plans W/ 9-elements	Watershed Mgmt Plans W/out 9-elements	Source Water Protection Plans Written	Other Plans
Totals		6	50	0	1	1	0	0	0
						Acres	Acres	Acres	Acres
						0	0	0	0

Total Maximum Daily Loads		TMDL Action Plans Written	TMDL Action Plans Implemented	BMP's Applied Toward TMDL's	TMDL Acres Treated	Stream Miles in compliance	Lake acres in Compliance
Totals		0	0	0	0	0	0

Education/Information		Field Days	Field Day Participants	Workshops	Workshop Particpants	Demonstration Sites	Demonstration Site Participants	Brochures, Curriculums, and Factsheets Developed	Brochures, Curriculums, and Factsheets Distributed	GIS Maps/Shape Files Developed	Interactive Maps Created
Totals		42	21760	14	527	0	0	0	0	4	2

Education/Information		PSA's Produced	PSA's Aired	Newsletters Developed	Newsletters Distributed	Webpages Produced	Webpage Views	Clean-Up Events Conducted	Clean-Up Event Participants	Tons Collected at Clean-Up Events
Totals		0	0	5	1318	13	42510	0	0	0

Water Quality Monitoring		QAPPs Produced	QAPP's Revised	Stream Teams Formed	Training Sessions Conducted	Volunteers Trained	Sampling Locations Monitored	Sampling Events Conducted	Water Quality Parameters Analyzed
Totals		0	2	8	7	16	216	1036	20

Groundwater Protection		Wells Plugged	Wells Monitored	Sinkhole/Karst Protection	Groundwater Remedations
Totals		0	0	0	0

Best Management Practices		BMP's Implemented	Acres Impacted by BMP's	Tons of Sediment Saved	Lbs. Nitrogen Reduced	Lbs. Phosphorus Reduced	Lbs. Pesticides Reduced	Other Load Reductions
Totals		0	0	0	0	0	0	0

Agricultural		CNMP Developed	CNMP's Updated	CNMP's Implemented	Acres Impacted by CNMP's	Animals Impacted by CNMP's	Animal Waste Facilities Built	Ilbs of Manure Transferred Out
Totals		0	0	0	0	0	0	0

Table 4. Summary of FFY13 319 NPS Project Evaluation Measures: Regional

Summary of All Region 319 NPS Project Evaluation Measures for FFY13

Year	2013	Region

Activities									
Planning		Groups Formed	Meetings Held	Total Cumulative Ave	Planning Documents Produced	Watershed Mgmt Plans W/ 9-elements	Watershed Mgmt Plans W/out 9-elements	Source Water Protection Plans Written	Other Plans
Totals		8	49	0	1	1	0	0	0
						Acres	Acres	Acres	Acres
						6800	0	0	0

Total Maximum Daily Loads		TMDL Action Plans Written	TMDL Action Plans Implemented	BMP's Applied Toward TMDL's	TMDL Acres Treated	Stream Miles in compliance	Lake acres in Compliance
Totals		0	0	4	2	0	0

Education/Information		Field Days	Field Day Participants	Workshops	Workshop Participants	Demonstration Sites	Demonstration Site Participants	Brochures, Curriculums, and Factsheets Developed	Brochures, Curriculums, and Factsheets Distributed	GIS Maps/Shape Files Developed	Interactive Maps Created
Totals		24	2464	63	3683	1	18	0	0	4	3

Education/Information		PSA's Produced	PSA's Aired	Newsletters Developed	Newsletters Distributed	Webpages Produced	Webpage Views	Clean-Up Events Conducted	Clean-Up Event Participants	Tons Collected at Clean-Up Events
Totals		5	22	21	80817	7	11976	5	358	4

Water Quality Monitoring		QAPPs Produced	QAPP's Revised	Stream Teams Formed	Training Sessions Conducted	Volunteers Trained	Sampling Locations Monitored	Sampling Events Conducted	Water Quality Parameters Analyzed
Totals		0	0	0	7	358	15	31	27

Groundwater Protection		Wells Plugged	Wells Monitored	Sinkhole/Karst Protection	Groundwater Remediation
Totals		0	1	0	0

Best Management Practices		BMP's Implemented	Acres Impacted by BMP's	Tons of Sediment Saved	Lbs. Nitrogen Reduced	Lbs. Phosphorus Reduced	Lbs. Pesticides Reduced	Other Load Reductions
Totals		135	407	10	11	2378	0	0

Agricultural		CNMP Developed	CNMP's Updated	CNMP's Implemented	Acres Impacted by CNMP's	Animals Impacted by CNMP's	Animal Waste Facilities Built	Ilbs of Manure Transferred Out
Totals		0	0	0	0	0	0	0

Table 5. Summary of FFY13 319 NPS Project Evaluation Measures: HUC Summary

Summary of All HUC 319 NPS Project Evaluation Measures for FFY13

Year	2013	HUC

Activities									
Planning		Groups Formed	Meetings Held	Total Cumulative Ave	Planning Documents Produced	Watershed Mgmt Plans W/ 9-elements	Watershed Mgmt Plans W/out 9-elements	Source Water Protection Plans Written	Other Plans
Totals		10	68	0	30	2	0	0	28
						Acres	Acres	Acres	Acres
						128151	0	0	24483

Total Maximum Daily Loads		TMDL Action Plans Written	TMDL Action Plans Implemented	BMP's Applied Toward TMDL's	TMDL Acres Treated	Stream Miles in compliance	Lake acres in Compliance
Totals		11	12	19	579	0	0

Education/Information		Field Days	Field Day Participants	Workshops	Workshop Participants	Demonstration Sites	Demonstration Site Participants	Brochures, Curriculums, and Factsheets Developed	Brochures, Curriculums, and Factsheets Distributed	GIS Maps/Shape Files Developed	Interactive Maps Created
Totals		69	2392	50	1695	72	834	0	0	153	73

Education/Information		PSA's Produced	PSA's Aired	Newsletters Developed	Newsletters Distributed	Webpages Produced	Webpage Views	Clean-Up Events Conducted	Clean-Up Event Participants	Tons Collected at Clean-Up Events
Totals		14	481	52	86742	120	28637	23	426	23

Water Quality Monitoring		QAPPs Produced	QAPP's Revised	Stream Teams Formed	Training Sessions Conducted	Volunteers Trained	Sampling Locations Monitored	Sampling Events Conducted	Water Quality Parameters Analyzed
Totals		1	4	4	5	22	80	494	130

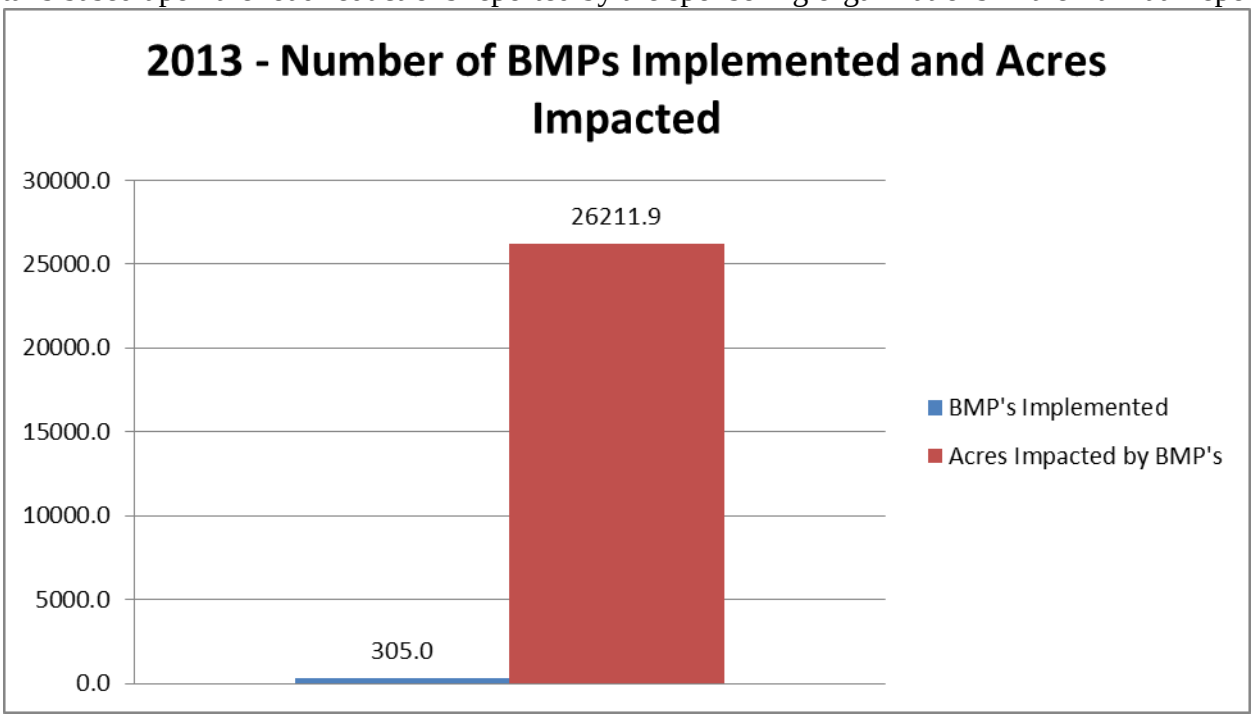
Groundwater Protection		Wells Plugged	Wells Monitored	Sinkhole/Karst Protection	Groundwater Remediation
Totals		1164	0	0	0

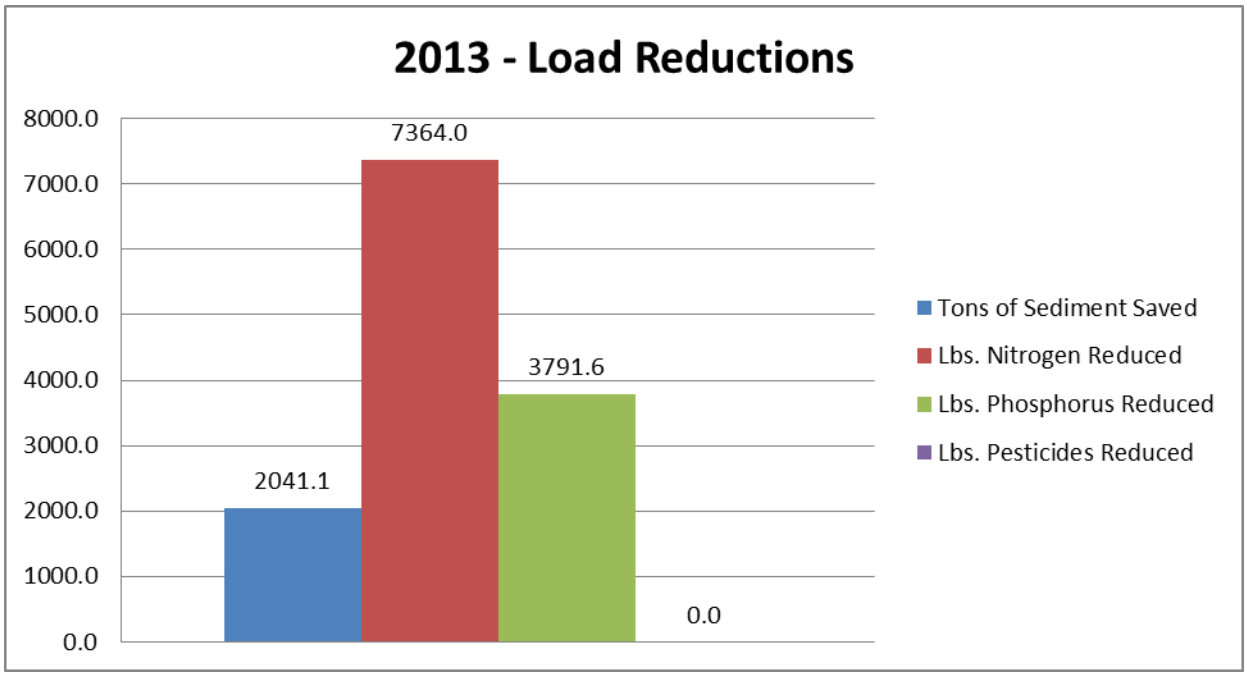
Best Management Practices		BMP's Implemented	Acres Impacted by BMP's	Tons of Sediment Saved	Lbs. Nitrogen Reduced	Lbs. Phosphorus Reduced	Lbs. Pesticides Reduced	Other Load Reductions
Totals		170	25805	2032	7353	1414	0	4669

Agricultural		CNMP Developed	CNMP's Updated	CNMP's Implemented	Acres Impacted by CNMP's	Animals Impacted by CNMP's	Animal Waste Facilities Built	llbs of Manure Transferred Out
Totals		0	0	0	0	0	0	0

Table 6. Number of BMPs and Sediment, Nitrogen, Phosphorus and Pesticide load reductions by 319 projects for the FFY2013.

Data is based upon the load reductions reported by the sponsoring organizations in their annual report.





3. Success Stories – EPA Published

A primary measure of state nonpoint source program success is taken directly from EPA's 2011 strategic plan: Goal 2: Protecting America's Waters, Objective 2.2: Protect and Restore Watersheds and Aquatic Ecosystems. The measure, referred to as WQ10 states: *By 2015, improve water quality conditions in 330 impaired watersheds nationwide using the watershed approach (cumulative).*

Under EPA's 2007 and 2011 strategic plan reporting requirements for WQ10, Missouri has submitted and had published on EPA's website (http://water.epa.gov/polwaste/nps/success319/) nine (9) success stories for eleven (13) water bodies that were removed from the 303(d) list of impaired waters using the 319 nonpoint source efforts and a collaborative watershed based approach to meet water quality standards. In 2013, Rocky Fork and Kelley Branch remedial successes were submitted and approved by EPA. Stakeholders accomplished sediment reductions and effective restoration and protection of Kelley Branch and Rocky Fork through abandoned mine land reclamation, state park management, education, and state agricultural cost share resulting in improved aquatic habitat. Kelley Branch and Rocky Fork were determined to be in compliance with applicable water quality standards and removed from the state's CWA section 303(d) list in 2010.

4. Water Quality Assessment Indicators of Progress

The Missouri Water Quality Report, also known as the 305(b) Report, provides a summary of water quality in Missouri and assesses how well the waters of the state are meeting national Clean Water Act goals. The report also contains maps showing which waters in the state are impaired; the pollutants that affect them, and the sources of those pollutants.

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

The following table presents the waters that were identified as impaired on the 2012 List of Impaired Waters that are proposed for delisting in 2014.

Table 7. Waters Appearing on the 2012 303(d) List of Impaired Waters but Proposed for De-Listing in 2014 for Meeting Water Quality Standards (WQS)

Year	WBID	Water Body Name	Pollutant	Delisting Reason	Delisting Comment
2014	2673	Big Cr.	Oxygen, Dissolved	WQS attained; recovery reason unknown	5/45 (11%) samples did not meet in 2012 listing, 2014 listing 5/68 (7.3%) did not meet.

Year	WBID	Water Body Name	Pollutant	Delisting Reason	Delisting Comment
2014	968	Burris Fk.	Oxygen, Dissolved	WQS attained; new assessment method	Used binomial probability method instead of straight percent calculation.
2014	3168	Chat Cr.	Zinc	4A - TMDL approved or established by EPA	TMDL approved 2006
2014	3168	Chat Cr.	Cadmium	WQS attained; recovery reason unknown	Only one exceedence in last three yrs of data, 2003, 04,06. Addn. mon. scheduled 2013.
2014	1706	Coldwater Cr.	Oxygen, Dissolved	WQS attained; new assessment method	used binomial probability error rate for large sample sizes.
2014	1706	Coldwater Cr.	Chloride	WQS attained; recovery reason unknown	Chloride levels have dropped significantly, assuming due to effort from MSD
2014	222	Dardenne Cr.	Oxygen, Dissolved	WQS attained; new assessment method	used binomial probability error rate rather than straight percentage.
2014	221	Dardenne Cr.	Oxygen, Dissolved	WQS attained; new assessment method	used binomial probability error rate rather than straight percentage.
2014	690	Dark Cr.	Oxygen, Dissolved	WQS attained; new assessment method	Used binomial probability for large sample sizes rather than straight percent
2014	36	Des Moines R.	Escherichia coli	WQS attained; recovery reason unknown	2005,2006 and 2011 data show compliance with WQ standard
2014	3178	Dry Fk.	Aquatic Macroinvertebrate Bioassessments	Status unknown - Orig listing in error	stream too small to be assessed against regional ref. streams
2014	3964	East Whetstone Cr.	Ammonia, Total	4A - TMDL approved or established by EPA	TMDL for ammonia, BOD approved 2002.
2014	2184	Grand Glaize Cr.	Oxygen, Dissolved	WQS attained; recovery reason unknown	
2014	97	Hays Cr.	Aquatic Macroinvertebrate Bioassessments	WQS attained; original listing incorrect	Re-assessed based on small candidate reference stream scores, not wadeable reference scores.
2014	7196	Knob Noster St. Park Lakes	Mercury in Fish Tissue	WQS attained; due to change in WQS	Lake Buteo was removed from this WBID and given a new WBID number (7469). That waterbody will be added to 2014 303d list.
2014	2171	Koen Cr.	Fishes Bioassessments	Status unknown - Orig listing in error	Invalid data used for listing.
2014	3839	Maline Cr.	pH	WQS attained; new assessment method	Re-evaluated using binomial probability, type one error rate on a decision of impaired was 0.457.
2014	1709	Maline Cr.	Chloride	WQS attained; recovery reason unknown	Addn. data 2010, 2011. Now meets LMD definition of unimpaired stream.
2014	2183	Meramec R.	Escherichia coli	WQS attained; recovery reason unknown	Most recent 3 yrs of data shows compliance with standard
2014	853	Muddy Cr.	Chloride	WQS attained; recovery reason unknown	Last 3 yrs of data do not exceed chloride standard
2014	170	N. Fk. Cuivre R.	Oxygen, Dissolved	WQS attained; new assessment method	used binomial probability rather than straight percent calculation.
2014	170	N. Fk. Cuivre R.	Fecal Coliform	WQS attained; recovery reason unknown	2012 E coli data shows compliance with standard
2014	3827	River des Peres	Escherichia coli	Status unknown - Orig listing in error	This segment changed due to re-segmentation, no monitoring sites in this water body.
2014	959	Straight Fk.	Chloride	4B - TMDL Alternative	PILO waiting EPA approval.
2014	3763	Tiff Cr.	Fishes Bioassessments	WQS attained; new assessment method	
2014	1225	Trib. to Big Otter Cr.	Oxygen, Dissolved	WQS attained; new assessment method	Used binomial probability rather than straight percent calculation.
2014	3943	Trib. to Foster Br.	Ammonia, Total	WQS attained; due to restoration action	Ashland has upgraded WWTP, are now running a lagoon and mech. plant hybrid
2014	74	Troublesome Cr.	Aquatic Macroinvertebrate Bioassessments	4C - Not caused by a pollutant	SHAPP scores indicate aq. habitat problems.
2014	1708	Watkins Cr.	pH	WQS attained; new assessment method	Used binomial probability rather than straight percent calculation to make assessment. Error rate was 0.25.

2014	3594	Williams Cr.	pH	WQS attained; new assessment method	used binomial probability error rate for large sample size instead of straight 10 percent.

Currently, Missouri's NPSMP uses the 2002 303(d) list as a base for which to measure progress. Missouri believes that 104 impairments identified in that list now meet state WQS, or approximately 49%. Approximately 82 water bodies identified on that list have restored or partially restored water quality. Restoration was achieved through the various processes including permits, compliance, education, revised standards, and changing management practices. Below in table 8 is a list of 2002 303(d) water body-pollutant pairs that now meet WQS.

Table 8. Water Body/Pollutant Pairs on 2002 Missouri 303(d) List Returned to Compliance with WQS by Jan. 2014

WBID	Water Body Name	Pollutant	Source	Size	Units	County	Comments
1224	Big Otter Cr.	pH	AML	1	Mi.	Henry/ St. Clair	Much data since 1998. WQS now met.
859	Brushy Cr.	BOD	Sedalia Central WWTP	1	Mi.	Pettis	Data since 1998. WQS now met.
859	Brushy Cr.	NFR	Sedalia Central WWTP	1	Mi.	Pettis	Data since 1998. WQS now met.
859	Brushy Cr.	Ammonia	Sedalia Central WWTP	1	Mi.	Pettis	Data since 1998. WQS now met.
3269	Buffalo Cr.	Nutrients	CAFOs	8	Mi.	Newton/ McDonald	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
3273	Buffalo Cr.	Nutrients	CAFOs	1.7	Mi.	Newton	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
709	Bynum Cr.	Sediment	Limestone Quarry	0.3	Mi.	Callaway	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
103	Salt R. Re-reg Pool	Iron	Cannon Dam	10	Mi.	Ralls	Secondary DW Standard removed from state WQ Standards
103	Salt R. Re-reg Pool	Manganese	Cannon Dam	10	Mi.	Ralls	Secondary DW Standard removed from state WQ Standards
737	Cedar Cr.	Sulfate	AML	4	Mi.	Callaway/ Boone	Data since 1998. WQS now met. Biomonitoring still indicates some concerns.
737	Cedar Cr.	pH	AML	1	Mi.	Callaway/ Boone	Data since 1998. WQS now met. Biomonitoring still indicates some concerns.
3238	Clear Cr.	BOD	Monett WWTP	1	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3238	Clear Cr.	NFR	Monett WWTP	1	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3238	Clear Cr.	Ammonia	Monett WWTP	1	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3239	Clear Cr.	BOD	Monett WWTP	2	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3239	Clear Cr.	NFR	Monett WWTP	2	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
3239	Clear Cr.	Ammonia	Monett WWTP	2	Mi.	Newton	Data since 1998. WWTP now meets BOD,NFR, Ammonia limits
690	Dark Cr.	Sulfate	AML	8	Mi.	Randolph	Data since 1998. WQS now met.
912	Davis Cr.	Low DO	Odessa SE WWTP	2	Mi.	Lafayette	New WWTP since 1998. Data since 1998 shows WQS now met.
2604	Eleven Point R.	Chlorine	Willow Springs WWTP	0.4	Mi.	Oregon	Improved disinfection at WWTP. Data since 1998 shows WQS now met.
3246	Elk R.	Nutrients	CAFOs	21.5	Mi.	McDonald	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
2860	Goose Cr.	Nickel	Madison Mine	0.5	Mi.	Madison	Mine discharged eliminated. Data since 1998 shows WQS now met.
1251	Honey Cr.	Sulfate	AML	3	Mi.	Henry	Data since 1998. WQS now met.
2582	Howell Cr.	Chlorine	West Plains WWTP	0.3	Mi.	Oregon	Data since 1998. WQS now met.
3259	S. Indian Cr.	Nutrients	CAFOs	9	Mi.	Newton	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
3260	N. Indian Cr.	Nutrients	CAFOs	5	Mi.	Newton	Monitoring indicates normal aquatic invertebrate community. No biological impairment.

WBID	Water Body Name	Pollutant	Source	Size	Units	County	Comments
2347	James R.	Nutrients	Multiple Pt/NPS	29.4	Mi.	Stone	Nutrient levels have declined due to point source controls. No numeric criteria in WQS.
2362	James R.	Nutrients	Multiple Pt/NPS	23.5	Mi.	Stone/Greene	Nutrient levels have declined due to point source controls. No numeric criteria in WQS.
2365	James R.	Nutrients	Primarily NPS	2	Mi.	Greene	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
1016	Kelley Br.	Habitat Loss	ORV Use	1	Mi.	Boone	Finger Lakes SP initiated changes to protect stream. Visual survey indicates improvement.
535	Long Cr.	Sediment	Limestone Quarry	0.2	Mi.	Caldwell	Data since 1998. WQS now met.
942	N. Moreau Cr.	NFR	California S. WWTP	10	Mi.	Cole	Lagoon replaced w/mechanical WWTP since 1998. Effluent is low in NFR.
1300	Mound Br.	Ammonia	Butler WWTP	1	Mi.	Bates	Data since 1998. WQS now met.
855	Muddy Cr.	BOD	Sedalia Central WWTP	33	Mi.	Pettis	Data since 1998. WQS now met. This portion of stream is now part of WBID 853.
1305	Mulberry Cr.	Sulfate	Reclaimed mined land	8	Mi.	Bates	Data since 1998. WQS now met.
3268	Patterson Cr.	Nutrients	CAFOs	2	Mi.	McDonald	No numeric WQS for nutrients. Insufficient data to determine WQ time trend.
1714	Rock Cr.	BOD	2 WWTPs	2	Mi.	Jefferson	2 WWTPs eliminated. WQS now met.
1714	Rock Cr.	Ammonia	2 WWTPs	2	Mi.	Jefferson	2 WWTPs eliminated. WQS now met.
1014	Rocky Fk.	Sediment	ORV Use	0.5	Mi.	Boone	Visual surveys since 1998 indicate WQS now met.
278	Rush Cr.	BOD	Platte Co. SD WWTP	4	Mi.	Platte	WWTP eliminated since 1998. Subsequent visual survey indicates WQS met.
2190	Saline Cr.	Ammonia	2 WWTPs	2	Mi.	Jefferson	2 WWTPs eliminated. Data since 1998 shows WQS now met.
91	Salt R.	Iron	Cannon Dam	29	Mi.	Ralls	Secondary DW Standard removed from state WQ Standards
91	Salt R.	Manganese	Cannon Dam	29	Mi.	Ralls	Secondary DW Standard removed from state WQ Standards
3249	L. Sugar Cr.	Nutrients	CAFOs	11	Mi.	McDonald	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
3250	B. Sugar Cr.	Nutrients	CAFOs	35	Mi.	Barry/ McDonald	Nutrient levels have not declined, but no longer listed in absence of WQS for nutrients
1282	E. Fk. Tebo Cr.	pH	AML	1	Mi.	Henry	Data since 1998. WQS now met.
1292	W. Fk. Tebo Cr.	Sulfate	AML	7	Mi.	Henry	Data since 1998. WQS now met.
2850	Trace Cr.	pH	Sawmill	4.7	Mi.	Madison	Sawdust management improved, leachate eliminated. 0.8 mi. still impaired by natural conditions
1211	Trib. Barkers Cr.	pH	AML	0.3	Mi.	Henry	Erroneously assigned to WBID 1211, is actually on unclassified trib. Trib. Still impaired.
1505	Whetstone Cr.	BOD	2 Mtn Grove WWTPs	2	Mi.	Wright	1 WWTP upgraded. Data since 1998 indicates WQS now met.
1719	Cameron Lake #3	Atrazine	Row crop farming	96	Ac.	DeKalb	Data since 1998. WQS now met.
7120	Cameron Lake #1	Atrazine	Row crop farming	25	Ac.	DeKalb	Data since 1998. WQS now met.
7121	Cameron Lake #2	Atrazine	Row crop farming	35	Ac.	DeKalb	Data since 1998. WQS now met.
7237	Fellows Lake	Algae	Ag/Urban NPS	820	Ac.	Greene	Only one episode of taste/odor complaints in last 20 years
7124	Hamilton Lake	Cyanazine	Row crop farming	80	Ac.	Caldwell	Cyanazine banned from all uses in 2001. WQ monitoring state-wide shows no occurrence.

WBID	Water Body Name	Pollutant	Source	Size	Units	County	Comments
7190	Higginsville Lake	Atrazine	Row crop farming	223	Ac.	Lafayette	Data since 1998. WQS now met.
7022	LaBelle Lake #1	Atrazine	Row crop farming	17	Ac.	Lewis	Data since 1998. WQS now met.
7023	LaBelle Lake #2	Atrazine	Row crop farming	112	Ac.	Lewis	Data since 1998. WQS now met.
7033	Mark Twain Lake	Atrazine	Row crop farming	18600	Ac.	Monroe	Data since 1998. WQS now met.
7031	Monroe City Rt. J Lake	Atrazine	Row crop farming	94	Ac.	Monroe	Data since 1998. WQS now met.
7031	Monroe City Rt. J Lake	Cyanazine	Row crop farming	94	Ac.	Monroe	Cyanazine banned from all uses in 2001. WQ monitoring state-wide shows no occurrence.
7077	Smithville Lake	Atrazine	Row crop farming	7190	Ac.	Clay	Data since 1998. WQS now met.
7205	Truman Lake	Manganese	Natural	10000	Ac.	Henry	Levels have not declined. Secondary DW Standard removed from state WQ Standards
7032	Vandalia Lake	Atrazine	Row crop farming	37	Ac.	Audrain	Data since 1998. WQS now met.
1250	Big Cr.	Sediment	Ag. NPS	49	Mi.	Johnson	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
449	W. Fk. Big Cr.	Sediment	Ag. NPS	18	Mi.	Harrison	EPA approved de-listing based on "reference stream" status*
436	Big Muddy Cr.	Sediment	Ag. NPS	8	Mi.	Daviess	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
653	Blackbird Cr.	Sediment	Ag. NPS	6	Mi.	Adair	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
921	S. Fk. Blackwater R.	Sediment	Ag. NPS	5	Mi.	Johnson	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
1336	Clear Cr.	Sediment	Ag. NPS	18	Mi.	Vernon	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
372	E. Fk. Crooked Cr.	Sediment	Ag. NPS	14	Mi.	Ray	EPA approved de-listing based on "reference stream" status*
865	Flat Cr.	Sediment	Ag. NPS	20	Mi.	Pettis	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
502	Grindstone Cr.	Sediment	Ag. NPS	16	Mi.	DeKalb	EPA approved de-listing based on "reference stream" status*
457	E. Fk. Grand R.	Sediment	Ag. NPS	25	Mi.	Gentry	EPA approved de-listing based on "reference stream" status*
468	M. Fk. Grand R.	Sediment	Ag. NPS	25	Mi.	Gentry	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
337	Honey Cr.	Sediment	Ag. NPS	8.5	Mi.	Nodaway	EPA approved de-listing based on "reference stream" status*
554	Honey Cr.	Sediment	Ag. NPS	23	Mi.	Livingston	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
212	Indian Camp Cr.	Ammonia	Landfill	0.3	Mi.	Warren	Data since 1998. WQS now met.
612	W. Fk. Locust Cr.	Sediment	Ag. NPS	17	Mi.	Linn	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
339	Long Br.	Sediment	Ag. NPS	6	Mi.	Nodaway	EPA approved de-listing based on "reference stream" status*
508	Marrowbone Cr.	Sediment	Ag. NPS	11	Mi.	Daviess	EPA approved de-listing based on "reference stream" status*
619	E. Fk. Medicine Cr.	Sediment	Ag. NPS	36	Mi.	Sullivan	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
623	W. Fk. (Little) Medicine Cr.	Sediment	Ag. NPS	Lower 20	Mi.	Mercer	Normal Invertebrate community. Upper 20 mi. still impaired based on biological monitoring
1299	Miami Cr.	Sediment	Ag. NPS	18	Mi.	Bates	Monitoring indicates normal aquatic invertebrate community. No biological impairment.

WBID	Water Body Name	Pollutant	Source	Size	Units	County	Comments
345	White Cloud Cr.	Sediment	Ag. NPS	11	Mi.	Andrew	EPA approved de-listing based on "reference stream" status*
674	Mussel Fk.	Sediment	Ag. NPS	29	Mi.	Sullivan	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
81	North R.	Sediment	Ag. NPS	40	Mi.	Marion	EPA approved de-listing based on "reference stream" status*
121	M. Fk. Salt R.	Sediment	Ag. NPS	49	Mi.	Monroe	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
657	Spring Cr.	Sediment	Ag. NPS	18	Mi.	Adair	EPA approved de-listing based on "reference stream" status*
710	Stinson	Ammonia	Fulton WWTP	0.5	Mi.	Callaway	Data since 1998. WQS now met.
248	L. Tarkio Cr.	Sediment	Ag. NPS	17.5	Mi.	Atchison	Monitoring indicates normal aquatic invertebrate community. No biological impairment.
7171	Long Branch Lake	Atrazine	Row crop farming	2430	Ac.	Audrain	Cyanazine banned from all uses in 2001. WQ monitoring state-wide shows no occurrence.
417	Blue R.	Chlordane	Urban NPS	4	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
418	Blue R.	Chlordane	Urban NPS	9	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
419	Blue R.	Chlordane	Urban NPS	9	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
421	Blue R.	Chlordane	Urban NPS	2	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
37	Fox R.	Manganese	Natural	12	Mi.	Clark	Secondary DW Standard removed from state WQ Standards
46	Wyaconda R.	Manganese	Natural	8	Mi.	Lewis	Secondary DW Standard removed from state WQ Standards
63	M. Fabius R.	Chlordane	Urban NPS	2	Mi.	Jackson	Monitoring since 1998 indicate tissue guidelines now met.
7255	Creve Coeur Lake	Chlordane	Urban NPS	300	Ac.	St. Louis	Monitoring since 1998 indicate tissue guidelines now met.
7054	Lake St. Louis	Chlordane	Urban NPS	525	Ac.	St. Charles	Monitoring since 1998 indicate tissue guidelines now met.
7211	Pleasant Hill Lake	Chlordane	Urban NPS	115	Ac.	Cass	Monitoring since 1998 indicate tissue guidelines now met.
76	N. Fabius R.	Manganese	Natural	82	Mi.	Marion	Levels have not declined. Secondary DW Standard removed from state WQ Standards
7205	Lake of the Ozarks	Gas Superst.	Truman Dam	50	Ac.	Benton	Modifications to spillway solved gas supersaturation problems.

III. Summary of FFY2013 319 Grant Program Dollars Spent

During FFY2013, $1,408,637 in federal 319 funds was awarded to 7 new projects for a total of 52 active 319 projects in total for the year. Funding in the amount of $3,305,505 was dispersed to 52 active NPS projects (4 contracts, 48 subgrants) in FFY2013 as summarized by grant number below.

Table 9. Dollars for Projects

319 Grant Dollars Expended for Projects		
Federal Aid Number	**Grant Year**	**Sum of Expended Amount**
C9007407-11	FFY2004	$136,528.76
C9007407-12	FFY2005	$106,495.67
C9007407-13	FFY2006	$468,819.65
C9007407-14	FFY2007	$1,373,130.59
C9007407-15	FFY2008-2009	$965,796.72
C9007407-16	FFY2010	$252,704.27
C90007407-17	FFY2011	$2,030.10
Total		**$2,405,637.88**

Of the 52 open subgrants/ contracts, the funds were used to support local, regional, and state 319 NPS pass-through projects. This funding was provided to sponsors for water quality education, demonstration, implementation, modeling, and monitoring. In FFY2013, $2,343,042 was allocated/ awarded to new projects to support pass-through NPS projects while, $1,543,157 was allocated/awarded to support the state's NPS water quality monitoring efforts, such as the USGS Ambient Water Quality Monitoring Network and Lake of the Ozarks and Pomme de Terre E. Coli Studies. Of the current 52 projects active to date, $14,053,949.78 in total has been awarded to the sponsors for support of NPS activities.

Commonly, Missouri has multiple 319 NPS grants open concurrently that provide funding for projects and various other activities related to Missouri's Nonpoint Source Program. Typically, older grant funds are expended first; however due to several variables, such as fluctuating costs and revised workplans, deobligation of funds from projects is not uncommon. Below is a summary of grants that were utilized for all NPS activities during 2013 and total amounts expended from each.

Table 10. Total 319 Dollars Expended

Total 319 Dollars Expended		
FEDERAL AID NUMBER	**GRANT YEAR**	**SUM OF EXPENDED AMOUNT**
BG997313113Z	FFY2012 PPG	$236,983.50
BG9973131339	FFY2013-2014 PPG	$930,180.16
C9007407-11	FFY2004	$297,568.82
C9007407-12	FFY2005	$106,461.83

FEDERAL AID NUMBER	GRANT YEAR	SUM OF EXPENDED AMOUNT
C9007407-13	FFY2006	$505,771.05
C9007407-14	FFY2007	$1,372,148.76
C9007407-15	FFY2008-2009	$948,045.04
C9007407-16	FFY2010	$252,704.27
C9007407-17	FFY2011	$2,030.10
Total		**$4,652,835.49**

The 52 active projects in FFY2013 utilized base and/or incremental funding for eligible activities such as implementation, demonstration, outreach, monitoring, education, and watershed planning. Table 11 below lists the active subgrant project name, project identification number, expiration date, and award amounts.

Table 11. Active Projects in FFY2013

Project Name	Recipient	Grant Number	End Date	Incremental Funds	Base Funds	Match Amount
Immanuel Rain Gardens for Clean Streams Project	Immanuel Lutheran School	C9007407-15	2012/12/31	$5,770		$3,870
Locust Creek Restoration Project	MDNR /DSP-Pershing Park	C9007407-13 C9007407-12	2012/12/31		$100,219 $130,750	$159,630
The Upper Shoal Creek On-Site System Implementation	Shoal Creek Watershed Improvement Group	C9007407-12 C9007407-14	2012/12/31	$115,959.88	$29,600	$108,331
Jefferson Farm Water Quality Demo	Thomas Jefferson Institute - Dr Myers	C9007407-13	2013/01/31	$188,000		$130,000
Lake of the Ozarks Niangua Arm WMP	Lake Ozarks Watershed Alliance - Niangua	C9007407-15	2013/02/15	$30,000		$20,000
UMC - Implementing Total Maximum Daily Loads through Locally Developed WMP's	University of Missouri - Columbia/Broz	C9007407-13 C9007407-12	2013/02/28	$59,691.65 $72,229.27		$131,823
NPS Pollution Prevention through Native Plantings in Stormwater Control	Jefferson City Samaritan Cntr	C9007407-15	2013/04/30		$6,000	$4,000
Kiefer Creek Watershed Restoration Project	Missouri Coalition for the Environment	C9007407-15	2013/05/31		$10,000	$7,008
Mingo Wildlife Refuge Atmospheric Samples of Mercury	University of Illinois - Yr 3/Volk	C9007407-13 C9007407-17	2013/06/30 2015/06/30	$59,547 $59,532		$0.00
North Fabius WQ Improvement Project	SWCD Schuyler - D Campbell	C9007407-13 C9007407-14	2013/08/31	$477,162 $65,932		$0.00
Partnership for Cleaner Water through Illegal Dump Cleanup, Education and Community Involvement	Meramec Regional Planning Commission - Snodgrass	C9007407-15	2013/08/31		$10,000	$7,426

Project Name	Recipient	Grant Number	End Date	Incremental Funds	Base Funds	Match Amount
Quick Creek Park Environmental Education Project	City of Doniphan	C9007407-15	2013/08/31		$10,000	$6,670
Upper Big River Water Quality Project	SWCD St. Francois Co - K Kollmeyer	C9007407-14	2013/08/31		$880,000	$0.00
Investigation of E. coli at Lake of Ozarks State Parks Beaches & Monitoring at Pomme De Terre SP	Missouri University of Science & Tech - Rolla	C9007407-16	2013/12/31	$42,700		$0.00
Investigation of E. coli at Lake of Ozarks State Parks Beaches & Monitoring at Pomme De Terre SP	USGS - Water Resource Division-Barks	C9007407-16	2013/12/31	$102,300		$0.00
Missouri Clean Marina - Upper White River Basin Pilot Program	Upper White River Basin Foundation	C9007407-15	2013/12/31		$10,000	$6,700
OMW Spring River Watershed Summit and Tour	Harry S. Truman Coordinating Council - Rogers H	SRF funds	2013/12/31	0.00	0.00	$0.00
Mid-Missouri Water Safety Project	Columbia Housing Authority	C9007407-15	2013/11/30		$8,000	$6,766
Tower Grove Heights Green Alley Project	City of St Louis	C9007407-13	2013/12/31		$744,000	$496,000
Black Creek Watershed Management Plan	RC & D, Northeast Council - Berry	C9007407-13	2014/02/28	$30,000		$0.00
Middle and Upper James River Show-MeYards, Neighborhoods, Farms and Ranches	James River Basin Partnership-Melissa	C9007407-16	2014/02/28	$353,506		$235,671
St Louis Earth Day Symposium 2012	St Louis Earth Day 2012 - Hage	C9007407-15	2014/02/28		$10,000	$12,915
MU Hinkson Creek Watershed Assessment of BMP's for WQ Improvements and Effectiveness	University of Missouri-Columbia/Inniss	C9007407-16	2014/03/31	$253,800		$169,267
Operation Brightside Demo Garden and Learning Center	Operation Brightside	C9007407-15	2014/03/31		$105,400	$70,302
Pride of Stride Project	SWCD Scotland County - D Campbell	C9007407-15	2014/04/14		$10,000	$6,667
Spring River WMP Implementation	Jasper County Commission - E District	C9007407-16	2014/04/14	$331,067		$197,672
Branson Storm Drain Marking Program to Reduce NPS Pollution	City of Branson - Menezes	C9007407-15	2014/04/30		$3,819	$2,546
Hinkson Creek Urban Retrofit Project	Boone County Resource Management	C9007407-15	2014/04/30	$713,266		$523,000

Project Name	Recipient	Grant Number	End Date	Incremental Funds	Base Funds	Match Amount
Storm Drain Marker Program	City of Rolla Public Works	C9007407-13 C9007407-15	2014/04/30		$7,500 $10,000	$11,667
The Gifted Garden Implementation and Ed Proj	Lake Area Industries	C9007407-15	2014/04/30		$10,000	$6,700.00
Wildcat Glades Education Project	Wildcat Glades Conservation - McAlester	C9007407-15 C9007407-14	2014/05/31	$45,959 $454,041	$128,401	$418,934
Lower Dardenne Creek Watershed Management Plan	City of St Peters	C9007407-15	2014/07/14	$30,000		$27,000
Northwoods- - Baden Creek Bank and Water Quality Stabilization	City of Northwoods - Lillian	C9007407-13 C9007407-14 C9007407-17	2014/07/14	$3,100 $356,900	$611,321	$647,568
Mill Creek Nonpoint Source Pollution Education and Engagement Program	Missouri Stream Team Watershed Coalition - Neil	C9007407-15	2014/08/21	.	$10,000	$6,670
Lakes of Missouri Volunteer Program (LMVP)	University of Missouri Columbia-Dr J Jones	C9007407-13 C9007407-15 C9007407-16	2014/08/31	$8,252.10 $236,394.00 $130,000.00		$244,271
Statewide Lakes Assessment Project	University of Missouri Columbia - Dr Jones	C9007407-13 C9007407-15	2014/08/31	$48,722.32 $166,934.00	$10,000 $10,927	$110,942
Well Decommissioning	SWCD Schuyler Co - Kearse	C9007407-15	2014/09/14		$10,000	$6,667.00
Keifer Creek Watershed Management Plan	Missouri Coalition for the Environment - Crandall	C9007407-15	2014/11/30	$30,000		$0.00
Improving Nonpoint Source Pollution Education through Project WET Workshops	University Missouri State - Cox	C9007407-15	2014/12/31		$103,759	$69,176.00
LOWA LILs for a Healthy Lake of the Ozarks	Lake of the Ozarks Watershed Alliance-Toole	C9007407-13 C9007407-15	2014/12/31	$236,000 $744,000		$653,333
S Grand Great Streets Initiative: Green Infrastructure Retrofits for an Urban Environment	East-West Gateway Council of Governments – D Wilson	C9007407-15	2014/12/31		$429,005	$268,005
Asher Creek 319 Project	SWCD Green Co - W Rhodes	C9007407-15 C9007407-16	2015/01/31	$50,000 $137,686		$0.00
Dev WMP for Spring Rvr Wshed and Dev info for 319 NPS Implementation Proj in Carthage MO	University Kansas State	C9007407-17	2015/01/31	$70,000		$0.00
Belews Creek WMP Implementation Project	Jefferson Co Stormwater Mgmt Div - Wiley	C9007407-15	2015/03/31	$180,200		$120,133
MO Botanical Garden Deer Creek Watershed Initiative Phase II	Missouri Botanical Garden - Frank	C9007407-14 C9007407-15	2015/03/31		$50,000 $780,724	$553,816

Project Name	Recipient	Grant Number	End Date	Incremental Funds	Base Funds	Match Amount
OMW Spring River WMP and other Dept. Prioritized Wshed Needs	University of Missouri-Columbia/B Broz	C9007407-18	2015/03/31	$233,042		$155,362
Dry Branch Watershed: Clear Stormwater and Green Parks Project	City of Wentzville	C9007407-15	2015/04/14	$748,015		$500,000
Springfield/Greene Co Urban Watershed Stewardship Project	Watershed Committee of the Ozarks-Armstrong	C9007407-14 C9007407-15	2015/04/30	$100,000 $1,000,000		$733,333
Table Rock Lake Area Stormwater Planning and Demo Project	Table Rock Lake WQ Inc. - G Borchelt	C9007407-15	2015/05/31		$550,600	$368,000
Spring River Watershed Planning Support and Coordination	Harry S Truman Coordinatin Council-H Rogers	C9007407-15	2015/06/30	$30,000		$0.00
James River Basin Riparian Corridor Restoration and Protection	James River Basin Partnership-Joe Pitts	C9007407-14 C9007407-17	2015/07/31	$563,000	$210,000	$515,353
Development of Reference Reaches in MO Streams	University of Missouri - Paukert	C9007407-15 C9007407-18	2016/06/30	$82,629	$8,152 $72,974	$109,170
Active Project Award TOTALS				**$8,645,337**	**$5,081,151**	**$7,832,363**

Among these active projects, seven new projects were awarded competitive or noncompetitive 319 NPS program funding. The assortment of new projects for FY2013 includes those specific to outreach, education, implementation, monitoring, or various combinations. A summary of the projects added in 2013 is provided below.

Table 12. FFY2013 New Subgrant/Minigrant Awards

Recipient	Project Name	Start Date	Award Amount	ID Number	Recipient Type
Upper White River Basin Foundation	Missouri Clean Marina - Upper White River Basin Pilot Program	2012/10/01	$10,000	G13-NPS-06	Nonprofit
USGS-Water Resources Division/yr21	Ambient WQ Monitoring Network Contract	2012/10/01	$842,308	AOC01380111C	Government
Kansas State University	WMP for Spring R. Watershed and info for 319 NPS Implementation Proj in Carthage MO	2013/02/01	$70,000	AOC13380100	Education Institution
Harry S Truman Coordinating Council	Spring River Watershed Planning Support and Coordination	2013/03/15	$30,000	G12-NPS-05	Government
University of Missouri-Columbia	OMW Spring River WMP and other Dept. Prioritized Watershed Needs	2013/04/01	$233,042	G13-NPS-07	Education Institution

Recipient	Project Name	Start Date	Award Amount	ID Number	Recipient Type
University of Missouri - Paukert	Development of Reference Reaches in MO Streams	2013/05/01	$163,755	G13-NPS-08	Education Institution
University of Illinois - Yr4/Gross	Mercury Deposition Network MOA -- Mingo Wildlife Refuge	2013/07/01	$59,532	G06-NPS-26-4	Education Institution
	Total		**$1,408,637**		

Other Activities of the 319 Program Staff

Some staff funded through the 319 program are responsible for promoting, implementing, and reporting progress of subgrant projects. Staff also perform activities not directly associated with a grant project such as providing input and direction on a wide variety of water quality related issues that are priorities for the Department. Staff serve on multiple workgroups and committees to help address issues which may include, but are not limited to, wetlands, forest management, lake monitoring, abandoned mine lands, animal waste handling, urban and stormwater runoff, TMDLs, mercury contamination, abandoned landfills, pesticide and nutrient planning, general agriculture, sand and gravel mining, watershed planning, source water protection, wellhead protection, State Revolving Fund (SRF) NPS on-site systems, and Missouri Stream Teams.

Staff participate in conferences and meetings, giving presentations as requested, and setting up displays at a variety of venues throughout the state to provide awareness about 319 NPS grant opportunities and disseminate information to those interested in addressing NPS problems.

IV. Other Department Nonpoint Source Water Quality Accomplishments

The Department programs listed in this section work in conjunction with the Nonpoint Source Program and can impact nonpoint sources and influence 319 projects either through shared funding to assist the projects, by providing information for watershed management plans, or by assisting in evaluating outcomes of 319 projects.

A. Soil and Water Conservation Program (SWCP) - Agricultural NPS SALT Program, State Cost Share, Mississippi River Basin Healthy Watersheds Initiative, Missouri Nutrient Reduction Strategy, and Nutrient Tracking Tool.

Mississippi River Basin Healthy Watersheds Initiative – The Mississippi River Basin Healthy Watersheds Initiative (MRBI) is a collaborative project with the USDA-Natural Resources Conservation Service (NRCS) to promote voluntary implementation of core and supporting conservation practices that avoid, control, and trap nutrient and sediment

runoff, improve wildlife habitat, restore wetlands and maintain agricultural productivity. A total of 13 states, including Missouri, were eligible to submit project proposals for MRBI funds. MRBI is not a grant program, but a program that provides federal cost-share funding for the implementation of farm conservation practices through a voluntary, incentive-based initiative. MRBI works with conservation partners to address nutrient and sediment loading, which have contributed to local water quality problems and hypoxia in the northern Gulf of Mexico. NRCS is working with producers using a conservation systems approach to manage and optimize nitrogen and phosphorus within fields, and reduce runoff and downstream nutrient loading. A total of 22 Missouri MRBI projects have been awarded funding; 12 in 2010, 6 in 2011, and 4 in 2012. If these projects are fully funded as planned over their four to five year project periods, the total amount of additional federal cost-share funding for implementing conservation practices in Missouri through this initiative will total $45.6 million. The six eligible 8-digit HUC watersheds for MRBI projects in Missouri included the Lower Grand, North Fork Salt, South Fork Salt, Little River Ditches, Lower St. Francis, and Cache Creek. Staff from the Department's SWCP and Water Protection Program (WPP) assisted eligible Soil and Water Conservation Districts with their project proposals for MRBI funding. State funding was committed for edge-of-field and in-stream monitoring by the Soil and Water Districts Commission to increase the quality of the proposals and make the applications more competitive with proposals from the other 12 states that were eligible to apply for the available MRBI funds. Multiple local, state and federal partners contributed to the success of these projects; including NRCS, SWCDs, and property owners. A joint funding agreement between the Department and the U.S. Geologic Survey is being used to monitor six stream sites in the Lower Grand watershed and attempt to detect any improvements in water quality that may be attributed to the implementation of conservation practices within six MRBI projects in that watershed.

Missouri Nutrient Reduction Strategy – In response to the ever-growing need to determine strategies for reducing nutrients to the environment, the Department formed the Missouri Nutrient Reduction Strategy Committee in October 2011. The committee is composed of representatives from state agricultural, environmental, and natural resource agencies and organizations and was tasked with developing recommendations for reducing nutrient loads to surface water and groundwater in Missouri through an open, consensus-building process. The primary goal of the Missouri Nutrient Reduction Strategy Committee is to develop a comprehensive, integrated state-level nitrogen and phosphorus reduction strategy called the Missouri Nutrient Reduction Strategy (Strategy). This Strategy is scheduled to be completed in 2014. After the Strategy is completed, implementation will be carried out under the umbrella of the Department's "Our Missouri Waters" Initiative. In particular, it is expected that the nutrient reduction strategies listed in the Strategy will be implemented by local watershed groups through watershed plans that include the EPA's 9-element approach, as well as other local, state and federal grant and cost-share programs. Development of state-level nutrient reduction strategies is the top priority of the Gulf Hypoxia Action Plan (2008). Missouri is a member of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force (Hypoxia Task Force), which drafted this document, and EPA is the co-chair of the Hypoxia Task Force. The Hypoxia Task Force was formed in 1997 and consists of five federal agencies and 12

state agencies. The Department represents the state of Missouri on the task force and its coordinating committee. The role of the task force is to provide executive level direction and support for coordinating the actions of participating organizations in reducing nutrient loads within the Mississippi River/Atchafalaya Basin.

Nutrient Tracking Tool – In December 2011, the Department entered into a contract with the Texas Institute for Applied Environmental Research (TIAER) of Tarleton State University to conduct a pilot project for applying and enhancing the Nutrient Tracking Tool (NTT) model in three 8-digit HUC watersheds (Spring River, North Fork Salt, and South Fork Salt) in Missouri as a field-level conservation practice assessment tool. In order to produce realistic estimates of nonpoint source pollutant loss reductions using NTT, available watershed-specific edge-of-field monitoring and farm management data were used to validate and calibrate the model. This project was completed in 2013. The Department plans to use NTT to help evaluate the effectiveness of farm conservation practices implemented through the Missouri Soil and Water Conservation Cost-Share Program in reducing sediment, nitrogen, phosphorus, and carbon losses from individual farm fields and in documenting the statewide success of the 1/10th of 1 percent Parks, Soil, and Water Sales Tax. In addition, NTT may eventually be applied to other 8-digit HUC watersheds in Missouri. Other available enhancements to NTT which may be considered in the future include incorporating the Soil and Water Assessment Tool (SWAT), the Farm Economic Model (FEM), and a nutrient credit trading platform. SWAT provides watershed-level evaluations of the effectiveness of farm conservation practices in improving downstream water quality; FEM can be used to determine which farm conservation practices are the most cost-effective in reducing sediment and nutrient loads; and a custom nutrient credit trading platform can be created based on state-specific trading rules and policies and used to facilitate nutrient credit trading between point-to-point and point-to-nonpoint sources.

The Agricultural Nonpoint Source (AgNPS) Special Area Land Treatment (SALT) Program has been discontinued. However, information on active and previously awarded projects can be accessed at: http://www.dnr.mo.gov/env/swcp/salt_overview.htm. Individual watershed goals and project descriptions may be viewed at that Web site.

Provided by funding through half of the 1/10th of one percent Parks and Soils Sales Tax of Missouri, the AgNPS SALT program was offered through the Department's SWCP. The program allowed county Soil and Water Conservation Districts (SWCDs) to direct technical and financial assistance to landowners with land identified and prioritized as having water quality problems, to address agricultural nonpoint sources of pollution. Success of these projects is dependent on the cooperation of numerous partners using a variety of tools to accomplish project goals.

Below is a list of the thirty-three (33) AgNPS SALT projects that were active in FFY2013. Approximately $4,000,000 of regular cost-share funds will support these projects until 2015. Throughout the time period when SALT grants were awarded, 319 staff assisted with prioritizing SALT applications based upon watersheds having 319

activities. Also, during this time period the SALT Coordinator and 319 NPS Coordinator participated in both program's project reviews and selection.

Table 13. FFY2013 Active AgNPS SALT Projects

Project #	District	Project Name
SEVENTH CALL		
SN068	Barton	Little North Fork Spring Creek
SN070	Caldwell	Shoal Creek
SN071	Carroll	Big Creek
SN072	Dallas	Greasy Creek
SN074	Maries	Little Maries River
SN075	McDonald	Indian Creek
SN076	Mercer	Muddy Creek
SN077	Montgomery	Bear/Brush Creek
SN079	Scott	Ramsey Creek
SN080	Stoddard	Dexter Creek
SN081	Vernon	Osage Plains
SN082	Wright	Woods Fork / Gasconade River
EIGHTH CALL		
SN083	Benton	Lower Cole Camp
SN084	Clinton	Shoal Creek
SN085	Cole	Grays Creek
SN086	Macon	Middle Fork Salt River
SN087	Montgomery	Lower Loutre
SN088	Osage	Little Maries Creek
SN089	Pemiscot	Pemiscot Clay Root
SN090	Saline	Salt Fork Creek
SN091	Scott	St. Johns Bayou
SN092	Stoddard	Bess Slough
NINTH CALL		
SN093	Bollinger	Hurricane Creek
SN094	Cape Girardeau	Byrd Creek
SN095	Cass	Upper Big Creek
SN096	Dunklin	Crowley Ridge
SN097	Greene	Pearson Creek
SN098	Oregon	Warm Fork of Spring Creek
SN099	Pettis	Heaths Creek
SN100	Randolph	Elk Fork Coon Creek
SN101	Ray	Crooked River
SN102	Scotland	South Wyaconda
SN103	Webster	James River Lower Headwater
SN104	Wright	Clarks Creek

The SWCP works with soil and water conservation districts (SWCD) to complete goals targeting agriculture nonpoint source pollution through cost-share practices. The cost-share practices that landowners may implement with approval of the local SWCD board of supervisors is comprised of seven resource concerns that address erosion and water

quality. Cost-share provides an incentive to landowners implementing practices by reimbursing 75% of the total estimated practice cost. Landowners must complete the practices based on SWCP guidelines and fund the remaining 25% of the practice cost themselves.

The seven resource concern areas are: Animal Waste Management, Grazing Management, Irrigation Management, Nutrient and Pest Management, Sensitive Areas, Sheet and Rill and Gully Erosion, and Woodland Erosion. There are 43 conservation practices within these resource concern areas that may help implement TMDLs through reduction of sedimentation and nutrient runoff. SWCDs set goals for each resource concern, determined by their annual Needs Assessment. Many of these practices address soil erosion, which consequently improves water quality by reducing sedimentation in our rivers and streams. The practices reduce soil erosion by a variety of methods that may include increasing crop residue, improving vegetation, diversion or containment of water to facilitate slower release, protection of stream bank and forested areas from livestock, and reduction of wind erosion.

During the 2012 Legislative Session, the Missouri General Assembly increased the SWCP's annual cost-share appropriation from 24 million dollars to 27.7 million dollars for state fiscal year 2013 forward. Program funding is made possible through one-half of the one tenth of one percent Parks, Soils and Water Sales Tax of Missouri. Below is a summary of estimated soil saved by HUC 8. Note that the load reduction values presented here are based upon the life of the conservation practice; typically ten years. Fractions of the total load reduction over life of the practices will occur annually and are not available for this report.

Table 14. State Cost Share and Tons of Soil Saved

HUC 8	State Cost Share	Sum of Total Tons Saved Over Practice Life	Number of Practices	HUC 8	State Cost Share	Sum of Total Tons Saved Over Practice Life	Number of Practices
07100009	$ 16,055.44	510.00	2	10280202	$ 383,552.99	30,896.00	61
07110001	$ 433,633.52	24,550.60	62	10280203	$ 135,154.09	10,708.00	25
07110002	$ 504,270.24	33,911.00	78	10290102	$ 191,785.36	1,070.00	45
07110003	$ 365,490.37	15,006.00	47	10290103	$ 61,366.30	2,555.00	11
07110004	$ 364,587.71	24,007.00	50	10290104	$ 240,709.74	12,020.00	77
07110005	$ 494,738.25	39,683.00	60	10290105	$ 395,409.31	9,262.00	112
07110006	$ 685,225.84	52,317.00	119	10290106	$ 1,164,216.01	9,860.00	327
07110007	$ 195,635.95	16,191.50	46	10290107	$ 502,056.22	-	157
07110008	$ 683,472.68	22,473.00	131	10290108	$ 1,322,335.85	9,652.00	299
07110009	$ 18,555.95	-	3	10290109	$ 278,616.89	5,779.00	98
07140101	$ 51,123.27	710.00	16	10290110	$ 319,994.21	9,282.50	93
07140102	$ 655,757.74	4,589.90	197	10290111	$ 795,094.13	45,254.00	257
07140103	$ 159,536.72	2,185.30	61	10290201	$ 1,013,357.94	17,748.50	295
07140104	$ 186,757.82	3,701.00	54	10290202	$ 218,027.19	7,700.00	62
07140105	$ 600,919.94	26,558.00	219	10290203	$ 417,483.24	13,781.50	121
07140107	$ 635,276.74	36,912.90	154	10300101	$ 1,288,038.37	56,054.50	195
08010100	$ 2,090.65	160.00	2	10300102	$ 1,496,430.90	29,113.00	336
08020201	$ 217,014.41	10,180.00	98	10300103	$ 1,107,268.52	17,033.80	220
08020202	$ 395,404.95	15,282.50	116	10300104	$ 1,362,635.59	60,934.00	235
08020203	$ 235,864.12	97,518.50	78	10300200	$ 371,044.06	6,361.00	100
08020204	$ 1,302,833.61	598,156.00	430	11010001	$ 28,195.89	192.00	6
08020302	$ 91,811.23	650.00	14	11010002	$ 1,270,194.26	30,488.50	362
10240004	$ 31,469.14	2,670.00	4	11010003	$ 551,472.01	7,148.50	172
10240005	$ 712,184.10	97,566.00	109	11010006	$ 599,113.88	30,297.70	172
10240010	$ 564,409.71	20,980.50	91	11010007	$ 545,952.58	20,111.00	164
10240011	$ 308,646.59	18,840.00	44	11010008	$ 733,972.59	44,484.50	208
10240012	$ 821,954.19	36,486.60	158	11010009	$ 51,623.55	4,787.50	16
10240013	$ 311,622.88	13,299.00	56	11010010	$ 282,337.54	7,401.50	92
10280101	$ 2,084,374.64	96,870.00	309	11010011	$ 598,803.15	7,688.10	178
10280102	$ 596,664.68	23,895.00	106	11070206	$ 141,641.14	-	39
10280103	$ 1,178,424.27	57,905.00	179	11070207	$ 1,198,789.97	29,395.50	365
10280201	$ 141,908.46	21,566.00	22	11070208	$ 649,008.36	615.00	174
				Grand Total	**$34,763,397.64**	**1,953,005.90**	**8,189**

B. Source Water Protection

Public Drinking Water information can be accessed at:
http://www.dnr.mo.gov/env/wpp/dw-index.htm

The Water Protection Program's Public Drinking Water Branch, in association with the U.S. EPA and other partners, has an active program to reach out to community planners and civic leaders to educate and inform the citizens of Missouri about the importance and benefits of establishing local voluntary source water protection programs. Although the state is required to administer a state-level protection program, participation on the part of

public water systems is voluntary. A central goal of the Missouri Source Water Protection Program is to foster and promote local voluntary source water protection planning and implementation and to provide general information, financial and technical assistance, and other support to communities that seek to protect their valuable drinking water sources.

The Safe Drinking Water Act (SDWA) Amendments of 1996 require states to develop preliminary source water assessment reports for all regulated primary water systems. These assessment reports provide a foundation upon which local communities can build more comprehensive protection plans to protect their unique sources of drinking water. The core elements of a source water assessment report include the following and are available to the general public as mandated by the SDWA.

- Delineate source water areas
- Inventory significant potential sources of contamination
- Determine the susceptibility of each public water supply to contamination

In addition to the core assessment elements shown here, a typical local voluntary protection plan also includes a planning team or steering committee, contingency plans in the event of a water shortage or contamination event and a basic management plan that provides a framework for the community's source water protection efforts.

There are currently 56 community water systems (CWS) in Missouri with endorsed source water protection plans. Of those, 43 systems utilize groundwater as a primary source of drinking water and 13 use surface water or a combination of surface and groundwater. Although approximately 4.9% of primary community water systems in Missouri have endorsed protection plans, these systems serve as many as 768,081 Missourians, or 17.8% of the population served by primary community public water systems (statistics include the population served by secondary systems that purchase water from a primary CWS with an endorsed protection plan).

In early 2013, the Public Drinking Water Branch developed a Source Water Protection Web page (http://dnr.mo.gov/env/wpp/pdwb/swpp.htm) that contains a variety of information related to source water protection in Missouri. The site includes a link to preliminary source water assessment reports for each primary water system in Missouri and hosts information about related source water protection financial assistance opportunities and other general information. *The Source Protector: The Official Newsletter of the Missouri Source Water Protection Program* is also available for viewing and download through this Web site.

CREP Overview

The Conservation Reserve Enhancement Program (CREP) is a voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water.

The program is a partnership among producers; tribal, state, and federal governments; and, in some cases, private groups. CREP is an offshoot of the country's largest private-lands environmental improvement program - the Conservation Reserve Program (CRP).

Like CRP, CREP is administered by USDA's Farm Service Agency (FSA). By combining CRP resources with state, tribal, and private programs, CREP provides farmers and ranchers with a sound financial package for conserving and enhancing the natural resources of farms.

CREP addresses high-priority conservation issues of both local and national significance, such as impacts to water supplies, loss of critical habitat for threatened and endangered wildlife species, soil erosion, and reduced habitat for fish populations such as salmon. CREP is a community-based, results-oriented effort centered on local participation and leadership. The Missouri CREP program is currently administered by the Department's SWCP.

C. Total Maximum Daily Load (TMDL) Development

Under the federal Clean Water Act, the TMDL program provides a framework for restoring impaired waters. Section 303(d) of the Act requires states to identify and list all waters that are failing to meet the state's WQS. These are waters that remain impaired even after existing regulatory and permitting requirements have been put in place. The state is required to develop a TMDL for each water body on the 303(d) list of impaired waters. The state's 303(d) list is revised and updated every two years and requires approval from the U.S. EPA. Missouri's most recently approved 303(d) list can be viewed on the Department's website at http://dnr.mo.gov/env/wpp/waterquality/303d.htm.

Developing a TMDL is a water quality-based process. A TMDL is a mathematical calculation of the maximum amount of a specific pollutant that a water body can absorb and still meet water quality standards. TMDLs identify the potential or suspected pollutant sources in a watershed and distribute the allowable pollutant loads among these various sources. A small portion of the allowable pollutant load is also reserved as a margin of safety to account for any uncertainties in scientific or technical understanding of water quality in natural systems. A TMDL must also address seasonality to ensure the pollutant loading allocated will be protective at all applicable times. Strategies and recommendations to protect or restore water quality and achieve the impaired waters' designated uses are included in a TMDL or in a supplemental TMDL implementation plan. All Missouri TMDLs are placed on a 45-day public comment period. Comments received are addressed with a written response, and the TMDL is amended as appropriate. Completed TMDLs are then submitted to EPA for approval.

From 1999 through September 30, 2013, 240 water body/pollutant pairs have had a TMDL or a permit-in-lieu of a TMDL completed and approved, or were delisted due to meeting water quality standards or being placed in a category that does not require a TMDL.

Information contained in a TMDL document includes:

- Location of the impaired water body.
- Identification of the pollutant(s).
- Potential sources of the pollutant(s).
- A calculation of the pollutant load that the water body can assimilate without becoming impaired.
- Reasonable assurances that TMDL allocations will be achieved.
- A plan to reduce the existing pollutant load and restore the water body to meet the standards for its designated use.

TMDLs are designed to include and address both point and nonpoint sources of pollution, which nonpoint source pollution occurs when runoff from rainwater, snowmelt, and crop irrigation carries pollutants into the water. If the source of the pollutant is solely due to a specific point source (e.g., a wastewater treatment plant) then a permit-in-lieu of a TMDL may be developed and submitted to EPA.

Additional information on approved TMDLs and those in progress can be viewed at the following Web site: http://www.dnr.mo.gov/env/wpp/tmdl/index.html.

D. Hazardous Waste Program (Superfund Sites)

In 1980, the U.S. Congress established the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), better known as Superfund. This law was passed in response to the indiscriminant disposal of the by-products of industrial life, which contaminated soil and water, resulting in threats to public health and the environment. The federal law provided both response and funding mechanisms for the cleanup of hazardous substance disposal sites. The Superfund Section is designed to clean up contaminated property where releases of hazardous substances have occurred in the past or are threatening to occur due to past practice. The federal law requires the past polluters, called responsible parties, to pay for the cleanup. The Department's Superfund Section has responsibility for many of these sites.

National Priorities List Sites (NPL)
http://www.epa.gov/region07/cleanup/npl_files/index.htm

- Annapolis Lead Mine, Iron County
- Armour Road, Clay County
- Bee Cee Manufacturing Co., Dunklin County
- Big River Mine Tailings/St. Joe Minerals Corp., St. Francois County
- Compass Plaza Well TCE, Greene County
- Conservation Chemical Co., Jackson County
- Ellisville Site, St. Louis County
- Fulbright Landfill, Greene County
- Lake City Army Ammunition Plant (Northwest Lagoon), Jackson County
- Lee Chemical, Clay County
- Madison County Mines, Madison County

- Minker/Stout/Romaine Creek, Jefferson County
- Missouri Electric Works, Cape Girardeau County
- Newton County Mine Tailings, Newton County
- Newton County Wells, Newton County
- Oak Grove Village Well, Franklin County
- Oronogo-Duenweg Mining Belt, Jasper County
- Pools Prairie, Newton County
- Quality Plating, Scott County
- Riverfront, Franklin County
- Solid State Circuits, Inc., Greene County
- Southwest Jefferson County Mining, Jefferson County
- St. Louis Airport/Hazelwood Interim Storage/Futura Coatings Co., St. Louis County
- Syntex Facility, Lawrence County
- Valley Park TCE, St. Louis County
- Vienna Wells, Maries County
- Washington County Lead District - Furnace Creek, Washington County
- Washington County Lead District - Old Mines, Washington County
- Washington County Lead District - Potosi, Washington County
- Washington County Lead District - Richwoods, Washington County
- Weldon Spring Former Army Ordnance Works, St. Charles County
- Weldon Spring Quarry/Plant/Pits (USDOE/ARMY), St. Charles County
- Westlake Landfill, St. Louis County

Proposed Sites

- No currently proposed sites

E. Land Reclamation Program

http://www.dnr.mo.gov/env/lrp/index.html

Historically, nearly 67,000 acres have been left unreclaimed by coal-mining operations, and an estimated 40,000 acres were left abandoned through the mining of other commodities. Missouri was left with many NPS related concerns such as acid mine drainage, dangerous high walls, hazardous water bodies, open wells and mine shafts, barren mine spoils, coal waste, soil erosion, stream sedimentation, and channelized streams.

The Land Reclamation Program plays an integral role in protecting and preserving Missouri's land and water resources. The program is responsible for regulating today's mining industry and for correcting health, safety and environmental problems associated with abandoned mines. When properly reclaimed, the land can once again be used as for a variety of uses, including agricultural and wildlife areas. Wildlife habitat remains a key concern of the Land Reclamation Program. Whenever possible, abandoned mines are reclaimed with native prairie grasses, trees, and mitigation waters and wetlands that are part of Missouri's history. Of primary importance to this report is that reclaiming abandoned mine land (AML) protects the environment by preventing or mitigating toxic or acid mine drainage, groundwater contamination and acid-sediment runoff from soil erosion.

In addition to coal mine reclamation, the program has been approved to use funds to close lead and zinc mine shafts throughout the state but primarily in southwest Missouri. During this period, there were no abandoned mine shaft that was closed to the benefit of groundwater quality in the lead/ zinc regions.

Millersburg Abandoned Mine Land Project: In July 2013, Pangea Group, of Saint Louis, Missouri, was given Notice to Proceed for the Millersburg Reclamation Project. The project is located two miles east of Millersburg, Missouri, along Miller's Creek. The project is divided into two work areas and will have reclaimed approximately 40 acres of an abandoned coal mine which was surface mined by Jennings and Crowson Coal Company. Mining activities commenced in the 1940s and continued to no later than 1947.

The primary purpose of reclamation is to eliminate and cover barren and eroding mine spoil piles and backfill three polluted water impoundments. The majority of the site is very poorly vegetated and comprised of exposed acid-producing spoil materials that are actively eroding off the site and adversely impacting Miller's Creek. All excavation activities are now nearing completing. Upon completion, all disturbed areas will be seeded and mulched to control erosion. The proposed completion date was originally set for October 8, 2013, however, an extension has been granted. The estimated total final cost for this project is $609,942.

Ardath Highwall Reclamation Project: On October 1, 2012, the Missouri Office of Administration issued TL Enterprises, Inc. an, "intent to award," followed by the notice to proceed on October 14, 2012. The areas of reclamation are located in the E1/2 of Section 30, T33N, R33W, approximately 2.7 miles north and 1.65 miles east of Burgess, Missouri, in Barton County. This ninety (90)-acre project eliminated the health and safety concerns associated with an abandoned surface coal mining operation. The major concerns were a dangerous highwall and two hazardous water bodies, located next to two heavily traveled graveled county roads (NW 60th Road and by NW 160th Lane on the east).

Mining activities by surface methods commenced in the 1920's and 30's. Gob material was disposed of at several locations in the area during the 1950's and 60's. Approximately 20 years ago the abandoned mine spoils were regraded and seeded with fescue by the current landowners.

On July 23, 2013, the Ardath Highwall Reclamation Project was deemed "Substantially Complete." All construction activities have been completed and all of the critical work including backfilling of the highwall and pits has been done. On an adjacent property, two-acre gob piles were graded and covered with two feet of cover material obtained from nearby mine spoils. Upon completion, the sites were seeded with a green cover crop to add organic matter to the developing soil and mulched to control erosion. A total of 90 acres will be seeded at a later date with a mixture of cool and warm season grasses. The final cost of construction for this contract was $664,867.64.

F. Financial Assistance Center and State Revolving Fund

State Revolving Fund (SRF) information can be found at: http://www.dnr.mo.gov/env/wpp/srf/. The SRF provides low-interest loans to communities for wastewater and drinking water infrastructure projects. Projects may be new construction or the improvement or renovation of existing facilities. Few of the following program individual awards are directly associated with 319 NPS subgrants; however, the Financial Assistance Center and SRF perform NPS related activities that contribute to Missouri's overall NPS control efforts. Various programs are listed below.

NPS Animal Waste Disposal Loan Program
This is a nonpoint source loan program designed to provide low interest financing to small producers for design and construction of animal waste treatment facilities. http://www.dnr.mo.gov/env/wpp/srf/cwsrf-animal-loans.htm

Brownfields Redevelopment
SRF monies may be loaned for Brownsfields Redevelopment if the project can result in a benefit to local water quality and if the category of problem is identified in Missouri's NPS Management Plan. The SRF funds can be used in conjunction with a number of other state and federal funding sources to affect the clean-up of a "Brownfields" site, underutilized or abandoned, contaminated, industrial property. The Department's Voluntary Cleanup Program provides technical oversight for Brownfield remediation. Additional financial incentives (tax rebates or credits) can be obtained through the Missouri Department of Economic Development's Brownfield Redevelopment Program.

NPS Loan Programs and Projects
The Financial Assistance Center (FAC) has completed development of the Missouri On-site Loan Program (MOLP). The Department has approved the implementation of two (2) limited pilot projects. The MOLP provides an interest subsidy on conventional financing for the purpose of resolving ongoing pollution issues resulting from failing on-site systems. The FAC will continue to consider other eligible NPS projects for financing through the SRF. In addition to storm water infrastructure projects, projects for agriculture best management practices, protection of wetlands and riparian corridors, landfill closures are examples of potentially SRF eligible NPS projects. Loan recipients for SRF-NPS projects may be governmental, private sector entities or individuals if the project is a benefit to water quality and the problem is addressed in Missouri's Nonpoint Source Management Plan.

Clean Water Act (CWA) Section 604(b)
CWA section 604(b) requires each state to receive 1% of the Clean Water SRF grant to carry out planning under the CWA section 205(j) and 303(e). Under CWA section 205(j)(3), each state must allocate at least 40% of its Clean Water Act section 205(j) grant to regional public comprehensive planning organizations or appropriate interstate organization.

FY2013 Section 604(b) Projects:

1. Boonslick Regional Planning; G13-WQM-01
   Grant funds will be used to inventory on-site wastewater systems within the Boonslick Regional Planning Commission region. Once completed, this inventory will be shared with regional partners with the purpose of providing homeowners a resource guide to help mitigate and improve water quality issues in the region. Workshop sessions to the homeowners, community leaders, and public health officials will be held with the intent to help abate the contamination occurring in the region's watershed area. An inventory will be used for high-accuracy address geocoding which will serve a diverse set of analytical applications such as demographics, spatial, dispatched services, nearest location queries, zoning, tax jurisdictions, etc. The data will also be used to evaluate the need for community sewer systems and to direct resources to homeowners to correct failing systems and allow the community, health officials, and other entities to direct and encourage future public infrastructure developments to the areas that may be lacking public facilities.

2. Lake of the Ozarks Council of Governments; G13-WQM-02
   This sewer line extension feasibility study will help planners to understand past precedent and establish a future vision for the land and resource use in the area known as the Normac Sewer District, and more specifically the Lake of the Ozarks. The extension of the district boundaries and collections system will help facilitate public and private investments in the Normac area in a manner that will improve the Lake area. The feasibility study will help ensure public investments in physical infrastructures, as well as private investments in the community, and improve the quality of water quality. By coordinating the investment, this study will help guide responsible growth while preserving private property rights, the local tax base, and important natural and cultural resources.

G. Water Quality Standards/Monitoring/Assessment

Water Quality Monitoring, Assessment, and Standards can be found at:
http://www.dnr.mo.gov/env/wpp/waterquality/

Water Quality Monitoring
The Department monitors water quality to:

- characterize background or reference water quality conditions;
- better understand daily, flow-event, and seasonal water quality variations and their underlying processes;
- characterize aquatic biological communities and habitats and to distinguish between the impacts of water chemistry and habitat quality;
- assess time trends in water quality;
- characterize the impacts of regional and local point and nonpoint source discharges on water quality;
- check for compliance with water quality standards or wastewater permit limits and monitor the effectiveness of pollution control activities; and

- support development of strategies to return impaired waters to compliance with water quality standards.

The Department released an updated version of the Missouri Water Quality Report, also called the 305(b) Report, in FY12. The complete document can be viewed at the following URL: http://dnr.mo.gov/env/wpp/docs/2012-305b-report.pdf

The Department also funds seventy-three USGS long-term monitoring stations. In FFY2013, $842,308 of 319 NPS funds were used in support of these monitoring stations. The Department used an additional $477,562 from other sources to support those USGS monitoring stations. Much of this data is made available on the Internet at: http://mo.water.usgs.gov/

Water Quality Standards
Information on Missouri's water quality standards can be found at: http://www.dnr.mo.gov/env/wpp/wqstandards/index.html

The objective of the Clean Water Act of 1972 along with its amendments are to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The first national set of water quality standards were published in 1983 and codified in 40 CFR Part 131. These regulations allow individual states to construct their own water quality standards framework providing there is no reduction in protection compared to federal guidelines.

Water Quality Standards are to be reviewed and modified every three years. Termed the triennial review process, coordinators with the Missouri Department of Natural Resources meet with the U.S. EPA, other state agencies, and concerned citizens to evaluate the effectiveness of our standards.

Water quality standards provide a means by which attainment of water quality objectives can be measured. The objective is protection of designated uses through the application of narrative or numeric criteria http://www.dnr.mo.gov/env/wpp/wqstandards/wq_criteria.htm. The level of protection given to a stream, lake, or river is dependent on the expected or "designated use(s)," of that water. Classified waters in Missouri have been assigned the designated uses that are listed in 10 CSR 20-7.031(c). The Antidegradation section requires actions to maintain existing uses.

Attainment frequency of water quality standards are used in identifying and characterizing waters of the state for purposes of compiling the 303(d) list and 305(b) report. In addition, effluent limits contained in NPDES permits are frequently derived using water quality standards. http://www.dnr.mo.gov/env/wpp/permits/

During FY2013 the Department initiated the 2012 triennial interim review of Missouri's Water Quality Standards (WQS) regulation at 10 CSR 20-7.031. The purpose of the 2012 this WQS triennial review is to address omissions and federal disapprovals from the

previous WQS rulemaking, and as well as to address current federal and state program priorities. Such priorities include applying "fishable/swimmable" use designations to currently unclassified waters, improving the ability of the Department to offer variances and schedules of compliance, and other revisions that make the state rule functionally equivalent to federal standards.

H. Environmental Services Program (ESP)

The Water Quality Monitoring Section (WQMS) of the ESP takes part in the important effort of the Department of Natural Resources to ensure that Missourians will always have clean water for drinking, recreation, tourism, and continued economic growth. Staff travels to all areas of the state conducting a variety of investigations. These investigations routinely include monitoring wastewater discharges, groundwater monitoring, electro fishing and stream surveys. The WQMS often assists with special projects such as enforcement actions, environmental risk assessments, or damage assessments resulting from chemical spills. The staff are responsible for and possess the expertise to collect and evaluate a wide variety of water, sediment, and macroinvertebrate samples. The results of these studies are used to ensure that the rivers, streams, and lakes of Missouri remain a treasure for all to enjoy. (From ESP web page.)

More information on the ESP can be obtained from their Web site, http://www.dnr.mo.gov/env/esp/ and at http://www.dnr.mo.gov/env/esp/esp-wqm.htm

The above link does not specify the work that was conducted, but there are established Quality Assurance Project Plans (QAPPs) that can be referenced to determine specifically what work has been done by ESP.

V. Agency Partnerships

Partner agencies' impact on NPS pollution is critical to nonpoint source programs. Both technical and financial assistance is available from various other state agencies to address nonpoint source pollution. This section highlights some the many significant contributions that some of our other agency partners made in 2013.

A. Natural Resources Conservation Service (NRCS)
http://www.nrcs.usda.gov/

The Missouri 319 NPS program frequently partners or participates in various NRCS activities. Collaboration takes place at the state and national levels through the State Technical Committee, Mississippi River Basin Initiative, and National Water Quality Initiative. At watershed scale, though not always directly associated with 319 priority watersheds, NRCS provides Environmental Quality Incentive Program (EQIP) Funds for soil and water quality management.

NRCS puts nearly 70 years of experience to work assisting America's private landowners with conserving their soil, water, and other natural resources. Local, state and federal agencies and policymakers also rely on their expertise. NRCS delivers technical assistance based on science and is suited to a customer's specific needs. Cost-share and financial incentives are available in some cases.

NRCS offers voluntary programs to eligible landowners and agricultural producers to provide financial and technical assistance to help manage natural resources in a sustainable manner. Through these programs the agency approves contracts to provide financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related resources on agricultural lands and non-industrial private forest land.

The many technical and financial assistance programs provided by NRCS include the following that are especially pertinent to NPS remedial efforts:

- The Environmental Quality Incentives Program (EQIP) is a voluntary program that provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years in length.
- The Wetlands Reserve Program (WRP) offers landowners the opportunity to protect, restore, and enhance wetlands on their property. NRCS provides technical and financial support to help landowners with their wetland restoration efforts. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection.
- The Conservation Reserve Program (CRP) reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filter strips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. The USDA Farm Service Agency administers the program with technical assistance provided by the NRCS to establish the conservation.

NRCS and partner achievements for FFY2013 through WRP and CRP are described in the tables below. EQIP values for Missouri were unavailable for this report.

Table 15. Federal Investments for Working Land Conservation Programs by Watershed

NRCS Federal Investments Made to Combat Non-Point Source Issues in Missouri Through Working Lands Programs Source ProTracts, USDA – REAP Division Certified October 1, 2012 – September 30, 2013			
Watershed	EQIP, WHIP, and CSP Contracting Activity for Conservation		
	No. of Contracts	Acres	Funding Obligations
07100009 Lower Des Moines	---	---	---

07110001 Bear-Wyaconda	12	2,470	354,218
07110002 North Fabius	11	2,031	307,809
07110003 South Fabius	10	1,413	340,262
07110004 The Sny	13	2,773	139,795
07110005 North Fork Salt	22	2,462	842,895
07110006 South Fork Salt	61	4,871	1,815,443
07110007 Salt	15	2,818	165,566
07110008 Cuivre	53	12,685	992,130
07110009 Peruque-Piasa	1	22	30,461
07140101 Cahokia-Joachim	11	716	143,237
07140102 Meramec	36	5,773	453,040
07140103 Bourbeuse	10	2,136	194,657
07140104 Big	7	224	75,978
07140105 Upper Mississippi – Cape Girardeau	51	7,522	686,169
07140107 Whitewater	41	6,255	701,245
08010100 Lower Mississippi-Memphis	4	1,490	40,535
08020201 New Madrid – St. Johns	9	5,639	222,238
08020202 Upper St. Francis	24	1,888	198,989
08020203 Lower St. Francis	52	9,975	1,034,109
08020204 Little River Ditches	168	52,347	3,802,727
08020302 Cache	16	4,123	276,661
10240004 Nishnabotna	1	82	922
10240005 Tarkio-Wolf	14	2,931	354,286
10240010 Nodaway	18	4,014	756,949
10240011 Independence – Sugar	6	643	70,745

Watershed	EQIP, WHIP, and CSP Contracting Activity for Conservation		
	No. of Contracts	Acres	Funding Obligations
10240012 Platte	19	2,307	575,035
10240013 One Hundred and Two	18	2,011	519,586
10280101 Upper Grand	41	6,205	700,766
10280102 Thompson	16	4,486	239,734
10280103 Lower Grand	153	13,576	5,757,882
10280201 Upper Chariton	5	2,530	25,362
10280202 Lower Chariton	8	551	67,218
10280203 Little Chariton	8	869	119,327
10290102 Lower Marais Des Cygnes	5	4,497	79,112
10290103 Little Osage	6	366	99,038
10290104 Marmaton	11	506	126,998
10290105 Harry S. Truman Reservoir	10	1,824	239,296
10290106 Sac	49	9,824	942,673
10290107 Pomme De Terre	15	2,671	680,177
10290108 South Grand	29	11,129	667,805
10290109 Lake of the Ozarks	15	1,578	177,393
10290110 Niangua	26	3,842	528,138
10290111 Lower Osage	21	6,169	552,001
10290201 Upper Gasconade	30	6,507	681,880
10290202 Big Piney	18	5,386	192,252
10290203 Lower Gasconade	26	2,334	337,781
10300101 Lower Missouri -Crooked	63	23,155	548,147
10300102 Lower Missouri-Moreau	70	8,189	1,099,533
10300103 Lamine	20	4,691	562,139
10300104 Blackwater	23	2,072	504,970
10300200 Lower Missouri	35	5,220	317,005
11010001 Beaver Reservoir	1	0	7,166
11010002 James	35	4,316	742,961
11010003 Bull Shoals Lake	22	1,616	272,461
11010006 North Fork White	32	7,778	551,063
11010007 Upper Black	27	11,973	449,795
11010008 Current	49	13,435	616,594
11010009 Lower Black	---	---	---
11010010 Spring	12	2,788	91,130
11010011 Eleven Point	38	10,574	648,511
11070206 Lake O' The Cherokees	1	93	1,000
11070207 Spring	65	10,186	980,302
11070208 Elk	12	309	183,277
Totals	**1,700**	**332,866**	**$ 34,886,575**

Table 16. Federal Investments through Conservation Easements in Missouri

Federal Investments Made Toward Non-Point Issues in Missouri Through Conservation Easements Source: NEST 10-21-2013 October 1, 2012 – September 30,2013				
	WRP		Farmland & Ranch Protection	
Watershed Basis	Agreements	Acres	Agreements	Acres
07110004 The Sny	1	36		
07110008 Cuivre	1	152		
07110009 Peruque-Piasa	1	120		
07140102 Meramac			1	80
08020201 New Madrid-St. Johns	1	99		
10280102 Thompson	1	40		
10280103 Lower Grand	3	263		
10290102 Lower Marais Des Cygnes	2	472		
10290108 South Grand	1	56		
10300101 Lower Missouri -Crooked	1	288		
11010008 Current	1	153		
11070207 Spring	1	140		

Mississippi River Basin Healthy Watersheds Initiative Projects and Tier 1 Edge-of-Field Water Quality Monitoring in Missouri

The U.S. Department of Agriculture – Natural Resources Conservation Service (NRCS) is allocating up to $80 million nationally in financial assistance each year over a four-year period from federal fiscal years 2010 through 2013 for the Mississippi River Basin Healthy Watersheds Initiative (MRBI). A total of 13 states including Missouri are eligible to submit project proposals for MRBI funds. MRBI is not a grant program. Federal funding is provided for conservation cost-share to producers through a volunteer, incentive-based initiative. MRBI works with conservation partners to address nutrient and sediment loading, which have contributed to local water quality problems and hypoxia in the northern Gulf of Mexico. NRCS is working with producers using a conservation systems approach to manage and optimize nitrogen and phosphorus within fields, reduce runoff and downstream nutrient loading, improve water quality, restore wetlands, and enhance wildlife habitat while maintaining agricultural productivity. Six eligible 8-digit HUC watersheds in Missouri targeted for MRBI include: Lower Grand, North Fork Salt, South Fork Salt, Little River Ditches, Lower St. Francis, and Cache Creek. Since 2010, Missouri has initiated 22 MRBI Projects statewide.

Key factors in Missouri's successful applications for MRBI funds from 2010-2012 have been the assistance provided by the Missouri Department of Natural Resources - Soil and Water Conservation Program (SWCP) to the county soil and water conservation districts (districts) in the preparation of their MRBI project proposals, the close working relationships between the districts and the Natural Resources Conservation Service's county offices, and SWCP's contributions of nonfederal matching funds and services-in-kind from the one-tenth-of-one-percent Parks, Soils and Water Sales Tax to the MRBI project proposals. Pledged state funds have included the estimated state cost-share payments that will be provided to producers within each MRBI project area during the

project period and estimated state cost-share payments to producers for edge-of-field and in-field water quality monitoring practices, and state funds provided to the U.S. Geological Survey for installing gaging stations and water quality monitoring of stream sites in the six MRBI project areas in the Lower Grand watershed. The leveraging of these state funds will bring up to $45.6 million in additional federal cost-share funds into the state of Missouri from 2010-2016. These funds will be beneficial to Missouri's environment and its economy. The estimated economic benefits to the state of Missouri from $45.6 million in additional federal cost-share include:

- Additional private investments of $15.2 million (25% cost-share required by producers) combined with the $45.6 million in federal MRBI funds for a total public and private investment of $60.8 million.
- Estimated total business sales of $77.5 million.
- Creation of over 150 jobs each year during the four-year project periods.
- Estimated $12.2 million in labor income.
- Estimated $16.7 million in property-type income.
- Estimated $2.1 million in indirect business taxes for local and state governments.
- Total value-added economic benefits of $31 million after adjusting for the public and private investments of $60.8 million from 2010-2016.

Conservation practices for the MRBI projects in Missouri were selected based on the soil and water conservation district annual needs assessments and NRCS priorities which are based on prioritization of applications through a ranking process that considers watershed resource needs. The most common conservation practices being implemented within the Lower Grand, North Fork Salt, and South Fork Salt watersheds include: terraces, cover crops, field borders, nutrient management, filter strips and riparian forest buffers along stream corridors. The most common practices being implemented within the Bootheel Area (Cache, Little River Ditches, Lower St. Francis watersheds) include: irrigation land leveling, irrigation underground pipeline, nutrient management, cover crops, irrigation water management, and shallow water development and management for wildlife.

All of Missouri's MRBI projects are actively implementing conservation practices. Approximately $30 million dollars has been obligated since the inception of MRBI with 84%, 72%, 40%, and 8% of the contracts from 2010, 2011, 2012, and 2013 currently completed. A total of 12 edge-of-field monitoring sites have been installed through MRBI projects. Sites are actively collecting water quality data in specific crop production settings under various conservation practices in order to provide the landowner with adaptive management information. Thus far, sites have been located in northern Missouri. Since 2010, national improvements to the national NRCS guidance have been made where all new activities will include paired or above and below watershed monitoring designs. These changes should strengthen the monitoring activities.

Initially, monitoring activities were only offered in MRBI but recently have expanded to the National Water Quality Initiative on a limited basis. It is anticipated that additional monitoring sign-up periods will be offered in the near future. To encourage producers to sign up for edge-of-field monitoring, the Soil and Water Conservation Program is

providing 25% cost-share payments to producers in conjunction with NRCS's 75% federal cost-share payments, so that producer's will not have any out-of-pocket expenses. Edge-of-field monitoring data is needed to document the effectiveness of conservation practices in reducing sediment and nutrient loading.

NRCS Conservation Efforts to Abate Sediment and Nutrient Exports from Missouri

Importance of Missouri Private Lands in Gulf Hypoxia Efforts

Missouri lays at the nation's crossroads for water confluences with the Missouri River, Ohio River, and Mississippi River all intersecting the state's borders. The Missouri and Mississippi rivers shape more than 1,000 miles of the state's borders and serve as major drainage ways to the Gulf of Mexico. Missouri is a large and diverse agricultural state, with significant grain and livestock production. Various studies list agriculture as one of the leading contributors of sediment and nutrient loading to the Gulf of Mexico. While this is unfortunate, it is not particularly surprising when one considers the land use requirements needed to supply the demand for food production. To that end, the private land owners of the state are an important resource to significantly enhance both local and national waters.

Federal Voluntary Approach to Sound Stewardship

Missouri NRCS, through its national framework, works extensively with private landowners, especially farmers and ranchers, to implement wise use of natural resources. To accomplish this goal, the NRCS focuses on the voluntary implementation of conservation practices that take a systems approach to addressing environmental issues. Research has shown that conservation practices, especially when installed as a system; make positive contributions to water quality through sediment, nutrient, and agricultural chemical reductions in both runoff and drainage waters. The objective is to maintain a productive land that is environmentally sustainable.

Missouri NRCS cooperates with state and local entities to set priorities and allocate technical and financial assistance through federal conservation programs. Perhaps the most essential program administered by NRCS is the Conservation Technical Assistance Program. This federal assistance basically allows the NRCS to extend technical advice to private landowners free of charge and without the obligation to participate in financial assistance programs. Providing technical advice to land managers places them in the best position to make well informed decisions regarding conservation.

Reviewing the Last Decade of Progress

For over 70 years, landowners in Missouri have received federal assistance to protect soil, water, air, plants, and animals. The federal investments made through the NRCS under working lands programs (Table 16) and conservation easements (Table 17) over the last decade are substantial. These federal assistance funds have also been leveraged by funds contributed by participants as part of program requirements. Because all planning procedures must have a positive planning effect on the resource concerns present, the end result of the contracting activities is an improved functioning ecosystem. Considering that many of the conservation practices have multi-year life spans, these conservation investments will yield environmental benefits for the nation for many years.

Table 16. NRCS Federal Investments Made on Missouri Working Lands to Combat Nonpoint Source Issues

NRCS Federal Investments Made on Missouri Working Lands to Combat Non Point Source Issues Source: USDA REAP Division Contract Years 2002-2012					
4 Digit Sub-region Watershed	Contract Count	Acres Under Contract	Financial Obligations for Conservation	Financial Payments for Conservation	Conservation Technical Assistance
0710 – Des Moines River Basin	14	2,042	$ 441,923	$ 346,909	
0711 – Upper Mississippi River - Salt	2,014	480,043	$ 41,132,496	$ 29,627,006	
0714 – Upper Mississippi River - Meramac	1,061	190,037	$ 12,743,475	$ 9,282,457	
0801 – Lower Mississippi River - Hatchie	10	7,727	$ 484,256	$ 306,469	
0802 – Lower Mississippi River – St. Francis	2,830	983,444	$ 186,624,579	$ 172,939,987	
1024 – Missouri River – Nishnabotna	1,355	271,441	$ 18,458,179	$ 14,242,955	
1028 – Chariton-Grand Rivers	1,652	295,816	$ 33,403,654	$ 19,522,684	
1029 – Gasconade – Osage Rivers	2,312	426,577	$ 34,595,589	$ 24,817,064	
1030 – Lower Missouri	2,623	471,369	$ 41,044,048	$ 33,785,455	
1101 – Upper White River	1,615	445,493	$ 26,753,606	$ 19,009,821	
1107 – Neosho – Verdigris Rivers	946	227,749	$ 29,130,936	$ 27,232,706	
Totals	16,432	3,801,738	$ 424,812,742	$ 351,113,514	$ 10,091,210

Table 17. NRCS Investments through Conservation Easements

NRCS Federal Investments Made Through Conservation Easements within Missouri* Source: USDA REAP Division Contract Years 2002-2012									
4 Digit Sub-region Watershed Basis			County Basis						
	Wetland Reserve Program			Grassland Reserve Program		Emergency Watershed Protection Program		Farm and Ranch Lands Protection Program	
	Easements	Acres		Easements	Acres	Easements	Acres	Easements	Acres
0710 – Des Moines River Basin	----	----	Adair	3	422				
0711 – Upper Mississippi River - Salt	78	8,045	Barton	3	212				
0714 – Upper Mississippi River - Meramac	15	2,266	Bates	2	409				
0801 – Lower Mississippi River - Hatchie	17	9,714	Benton	3	492				
0802 – Lower Mississippi River – St. Francis	68	9,673	Cedar	3	288				
1024 – Missouri River – Nishnabotna	23	2,006	Christian					1	70
1028 – Chariton-Grand Rivers	133	15,893	Dade	1	159				
1029 – Gasconade – Osage Rivers	31	3,560	Chariton			1	47		
1030 – Lower Missouri	85	7,374	Dunklin			1	207		
1101 – Upper White River	7	363	Lawrence	3	479				
1107 – Neosho – Verdigris Rivers	9	440	Linn			3	1501		
			Livingston			1	146		
			Mississippi			3	153		
			Pettis	3	134				
			Pemiscot			3	241		
			Pike			1	226		
			Polk	1	38				
			St. Clair	4	457				
			Sullivan	2	169				
			Vernon	8	923				
Totals	470	59,334	Totals	36	4,182	13	2,521	1	70

**Additional $4,614,320 in conservational technical assistance funds extended by NRCS to administer and service the easements.*

Targeting Conservation for Better Efficiency

As advancements in science have been made available, conservation professionals are gaining a better understanding of the importance of targeting efforts. Not all lands contribute equally to sediment and nutrient loading of streams and lakes. Identifying vulnerable areas on the land provides the greatest opportunity to reduce pollution effects. Each year, requests for federal funds exceed allocations made by the Secretary of Agriculture. Historically, NRCS ranking and screening protocols strive to select applications that will make significant environmental enhancements to land in the fairest possible manner.

In addition to general operating procedures, the Missouri NRCS participates in two national landscape initiatives that further target conservation activities in priority watersheds. In Missouri, the NRCS State Conservationist authorized the Lower Grand, North and South Fork Salt, Lower St. Francis, Little River Ditches, and Cache River 8-digit watersheds eligible to participate in the MRBI. Projects from local sponsors within these 8-digit focus areas were solicited to address watershed concerns. Since 2010, 22 active MRBI Projects have been developed to utilize a systems approach by selecting core and supporting practices that AVOID, CONTROL, and TRAP nutrients. Projects are on-going, but from 2010-2012 Missouri NRCS entered into 874 voluntary contracts with private landowners on 80,726 acres of land through the MRBI.

In 2012, the NRCS created the National Water Quality Initiative (NWQI), a national initiative that works in priority watersheds to help farmers, ranchers and forest landowners improve water quality and aquatic habitats in impaired streams. In consultation with local and state entities, Missouri NRCS now offers additional assistance to help producers implement conservation and management practices in smaller, 12 digit watersheds in the North Fork of the Spring River, Little Medicine Creek, and Troublesome Creek. The federal efforts are leveraged with other local and state partners to magnify efforts. Together, MRBI and NWQI accelerate funding for land treatment over and above existing NRCS efforts.

Future Efforts by the NRCS

Although national priorities are set by the Secretary of Agriculture and may vary according to the administrative governance in place, the protection of soil and water are paramount for the agency. All NRCS programs and operations are subject to congressional authorization through the federal budgeting process, primarily through the "Farm Bill." These activities undergo periodic revisions and are subject to the prevailing political climate. Even so, most elected officials recognize how important conservation investments are to benefit the nation's resources and productivity. Although the administration and funding levels may fluctuate from year to year, it is anticipated that future conservation programs will remain available to the public in some form.

B. Missouri Department of Health and Senior Services

http://health.mo.gov/

The mission of the Department of Health and Senior Services (DHSS), Bureau of Environmental Health Services, and Bureau of Environmental Epidemiology are to

protect and promote quality of life and health for all Missouri citizens by developing and implementing programs and systems that provide:

- Assessment services for environmental health conditions,
- Public assurance through education, effective regulation and oversight, and surveillance of environmental health conditions, and
- Public health policies that effectively achieve the DHSS mission.

There is particular cooperation and partnership regarding nonpoint source issues relating to private drinking water, on-site sewage, and other various wastewater systems.

The DHSS Health Laboratory provides limited private well testing services for public assurance of environment health. Local county public health agencies and DHSS provide technical advice to private well owners related to drinking water quality.

The DHSS Bureau of Environmental Health Services works to educate and license contractors that construct or repair on-site wastewater treatment systems. A listing by county of On-Site Wastewater Treatment System Installers may be found at http://health.mo.gov//living/environment/onsite/counties/index.php. In general, DHSS also works with local county public health agencies on the issuance of onsite wastewater treatment system permits. (http://health.mo.gov/living/environment/onsite/permitprocess.php)

To assure the public of fish consumption safety, the DHSS Bureau of Environmental Epidemiology also assesses fish tissue data obtained from Missouri Department of Conservation (MDC) and Department of Natural Resources (DNR) and completes an annual fish consumption advisory. (http://health.mo.gov/living/environment/fishadvisory/index.php)

Related to fish consumption safety, DHSS also provides technical support for DNR's Section 303(d) Impaired Waters Listing and TMDL listings. As needed, DHSS also cooperates with MDC and DNR on fish kills and pollution investigations to protect public health from these events.

C. Missouri Department of Conservation
http://mdc.mo.gov/

Strategic goals of the Conservation Commission and the Missouri Department of Conservation (MDC) are to preserve and restore the state's biodiversity; to inform and educate the public about fish, forest and wildlife conservation; to help landowners manage their land for sustainable resources; to develop and maintain public land that invites public use; and to integrate conservation principles and urban lifestyles. Creating effective partnerships, retaining public support, recruiting new participants and improving their business management systems are also important goals.

During FFY2013, Fisheries Division staff responded to 4,741 requests for watershed, floodplain, riparian corridor, stream or lake management information and/or technical assistance. We made 630 on-site visits and wrote 75 recommendations or management plans. On-site work included 128 fish-population surveys, 24 renovations and 50 fish-kill investigations. Staff conducted 30 stream or lake management workshops for 1,218 people. We also coordinated or participated in 17 active watershed-management projects.

D. Missouri Department of Agriculture

http://mda.mo.gov

The Missouri Department of Agriculture (MDA) sets agriculture policy and provides assistance to farmers throughout the state. While the Department maintains its regulatory functions, its expanded duties include: consumer protection; public health roles; environmental advocacy; agricultural marketing; public information and awareness; and promoting new technology and new uses for Missouri's agricultural goods. As its primary mission, the Department strives to serve, promote, and protect the agricultural producers, processors, and consumers of Missouri's food, fuel, and fiber products.

Pesticide Applicator Training

Section 281.100 and 2 CSR 70-25.050 (2) of the Missouri Pesticide Use Act and Code of State Regulations authorizes the Missouri Department of Agriculture's Bureau of Pesticide Control to establish minimum criteria for re-certifying Missouri certified Commercial and Non-commercial Pesticide Applicators and Public Operators. Each re-certification training course must be approved in advance by the Bureau of Pesticide Control. http://mda.mo.gov/pi/pesticide_control.htm

Dead Animal Reporting

The Animal Health Division responds to reports of dead livestock that have not been properly disposed. Division staff does not dispose of the animals, but do attempt to locate those responsible and see that they properly dispose of the carcasses in a timely manner as required by the Disposal of Dead Animal Law, Chapter 269, RSMo. http://www.mda.mo.gov/ah/dead_animal.htm. The division only investigates animals raised for commercial purposes and does not respond to reports of dead animals under the Wildlife Code (deer, coyotes, etc.), or pets, whether confined or stray.

Recently, MDA began a new Bridge Loan Program. Short term loans can be made to landowners approved for EQIP or State Cost Share funds to implement the practice more quickly. Cost hare money then pays off the loan. A conservation plan is required. http://mda.mo.gov/abd/financial/bridge.php

E. United States Geological Survey

http://mo.water.usgs.gov/district_info/index.htm (MO Water Science Center)

The United States Geological Survey (USGS) is the nation's largest earth-science agency and has the principal responsibility within the federal government for providing hydrologic information and for appraising the nation's water resources. The water

resources of Missouri consist of numerous streams, springs, lakes, and aquifer systems. During water year 2013, the USGS Missouri Water Science Center measured continuous stream flow at 257 stream-gauging stations, continuous water-surface elevation at 15 lakes and reservoirs, continuous water-level elevation at 167 ground-water wells, and water-quality at 26 surface water-quality stations. Discrete water-quality sampling was performed at 75 stations at intervals ranging from bi-weekly to quarterly. These hydrologic data and other data are used in research and hydrologic studies to describe the quantity, quality, and location of Missouri's water resources. The collection, analysis, and interpretation of these data are done in cooperation with other Federal, State and local agencies, universities, and research centers. All data are made available on the Internet at http://waterdata.usgs.gov/mo/nwis.

VI. Teams, Committees, and Volunteers

A. Missouri Water Quality Coordinating Committee

The Water Quality Coordinating Committee (WQCC) is an informal interagency and public committee dealing with water quality issues. Representatives from non-profit organizations, universities and colleges, cities and businesses, as well as state, federal and local agencies, regularly attend WQCC meetings. It is informal in that the committee has no statutory or regulatory foundation. It exists through and for the participants. Each agency or group brings issues, information or requests to the committee that are related to water quality, and each continues to exercise its statutory responsibilities.

The Department of Natural Resources originally convened the WQCC to deal with animal waste issues, specifically, poultry in southwest Missouri. The committee's activities continue to be organized through the Department's Water Protection Program. As a forum for discussion among agencies on that issue, it was readily apparent that the information exchange and coordination opportunities afforded by the committee were valuable far beyond that original issue, and the committee's scope expanded. A sampling of issues brought before the committee for this reporting period include: Statewide Lake Assessment Program - 2012 Statewide Data; Lakes of Missouri Volunteer Program and blue green algae; Atrazine Overview and Update; Native Soil BMPs; National NPS Program Reform; Reformed State NPS Approach; and USGS Water Quality Resources, 319 Nonpoint Source Program Request for Proposals.

The committee meetings are open to the public, which gives the public an opportunity to address the agencies on specific water quality concerns. Speakers included members from Missouri Department of Natural Resources, USGS, University of Missouri, EPA Region 7, and others. The Committee may also assist in the coordination and implementation of watershed protection strategies.

During this annual reporting period, six meetings were held. Future meeting information and minutes from previous meetings can be found on the Department's Web site at http://www.dnr.mo.gov/env/wpp/wqcc/index.html.

B. Water Protection Forum

The Water Protection Forum was initiated in May 2005 as a means to involve a diverse set of individuals in water quality policy discussions. A wide diversity of interests is represented in the forum, including agriculture, municipalities, industry, environmental groups, consultants, attorneys, and others. The Department must always consider how policy issues affect regulated entities and the public and this is a means to solicit input from those affected interests.

Due to the many complex issues presented at the main Water Protection Forum meetings, the group formed several advisory groups to work on selected issues. These subcommittees include:

Current Advisory Groups

- Affordability Subcommittee
- Chapter 8 Wastewater Design Guide Revisions
- Clean Water Fees
- Concentrated Animal Feeding Operations Operating Permits
- Effluent Regulation Revision
- Nonpoint Source Management Plan Revisions
- Nutrient Criteria Development Stakeholder Workgroup
- Construction and Operating Permits Workgroup
- Small Systems Workgroup
- Water Classification Workgroup
- Additional Environmental Workgroups and Forums

During this annual reporting period, six meetings of the entire forum were held along with multiple subcommittee meetings. Note that due to potential 319 NPS Program reforms, the Nonpoint Source Management Plan Revisions subcommittee did not convene during this reporting period; however a draft of the new proposed NPSMP will be presented for comment in FFY2014. Future meeting information and presentations from previous meetings can be found on the Department's Web site at http://www.dnr.mo.gov/env/wpp/cwforum/index.html.

C. Water Resources Center

Information on the Department's Water Resources Center can be found at: http://www.dnr.mo.gov/env/wrc/index.html.

The Mission of the Water Resources Center is to administer the development, conservation and use of the state's water resources. The Center's primary role is to provide technical advice and assistance on water use, comprehensive water supply and use planning, ground water, and surface water hydrology.

Collection, maintenance and interpretation of water resources information is imperative in order for Missouri to respond to environmental and economic problems related to

water. Types of issues requiring this kind of information include: interstate water availability and usage, public water well locations, water quality and quantity determinations, drought and flood response and planning, coordination and resolution of river basin issues, major water users data collection, groundwater and surface water contamination potential and prevention, and water use decisions.

One can find links to a magnitude of information, both for general knowledge and potentially helpful for watershed planning. These links include drought information, dam and reservoir safety, interstate waters, State Water Plan, groundwater, springs and caves, major water users, surface water, wetlands, publications, forms, frequently asked questions, a staff directory and links to other water related sites.

D. Missouri Stream Teams/Volunteer Water Quality Monitoring Program

A summary of Stream Team-related activities, including Volunteer Water Quality Monitoring (VWQM) can be found in this section. More detailed information about Missouri Stream Team and Volunteer Water Quality Monitoring programs can be found at http://www.dnr.mo.gov/env/wpp/VWQM.htm. The number of Stream Teams formed in fiscal year 2013 was 191. These are comprised of 166 teams formed by adults and 25 youth formed teams. Overall, the VWQM Program had 1875 various activities, involving 12,587 participants and more than 50,200 volunteer hours.

The number of volunteers attending the Missouri Stream Team Program's VWQM workshops in calendar year 2013 was 333 attendees at 30 workshops. Note: Individuals can and do attend more than one workshop in a year. Therefore, the number of citizens trained without counting them twice or three times would be slightly less than the count provided. The individual workshops/audits have the following values:

- 9 "Introduction to VWQM" workshops attended by 231 citizens.
- 6 Level 1 workshops attended by 97 individuals.
- 4 Level 2 workshops attended by 24 participants.
- 5 Level 3 audit held for 3 participants.
- 3 Level 3 CSI audits for 3 participants.
- 5 VWQM Validation workshops attended by 23 Level 2 and higher participants.
- 1 Macroinvertebrate Workshop attended by 21 individuals.

Amount of data submitted to the Stream Team Program: See individual watershed (8-digit HUC) descriptions. Number of newsletters developed by Stream Team staff:

- Missouri Department of Conservation's Channels newsletters can be found at http://www.mostreamteam.org/channel.asp

Stream Team Activities: The Missouri Nonpoint Source Management Program Annual Report for Federal Fiscal Year 2013 follow.

Table 19. Stream Team Training Levels by HUC

(Levels listed lower to higher)

HUC8	WQ001	WQ102/102	WQ201/202	WQ301	WQ401
07100009					
07110001	1	1	15		
07110002					
07110003			6		
07110004					
07110005					
07110006	1				
07110007					
07110008		7		4	
07110009		2			34
07140101	19	151	70	29	
07140102	23	127	137	29	
07140103		4	10		
01740104	2		8		
07140105	2				
07140107	6				
08010100					
08020201					
08020202		3	3		
08020203					
08020204					
08020302					
10240001					
10240004					
10240005			21	10	
10240010					
10240011	2	2	1		
10240012	2	12	2		
10240013	4	4	4		
10270104					
10280101			6		
10280102			3	4	
10280103					
10280201					
10280202					
10280203					
10290102			2		
10290103					
10290104					
10290105			3		
10290106	2	1	7	21	
10290107		8	11		
10290108	4	7			
10290109	5	26	4		
10290110	2		30	32	

HUC8	WQ001	WQ102/102	WQ201/202	WQ301	WQ401
10290111	4	4	6		
10290201	6	4	16		
10290202	6	2	21		
10290203	3	12	17	1	
10300101	14	15	16		
10300102	33	24	30	1	
10300103	7	7	8		
10300104	5	9			
10300200	24	15	22	5	34
11010001	2	16	1		
11010002	23	125	3	24	
11010003	15	84	4		
11010006		74	15	17	
11010007	5		2		
11010008	24	6	2		
11010009					
11010010					
11010011					
11070206			11		
11070207	9	3	64	3	
11070208	4				

Table 20. Table of Stream Team Activities during FFY 2013

Activity	Participant	Hours	Units	Value
Adopt an Access	12	27	10 agreements	$597.78
Advocacy	85	599	80 events	$13,261.86
Articles Written	34	246	87 articles	$5,446.44
Association Activities	707	2662	258 events	$58,936.68
Award Winners	65	210	11 awards	$4649.40
Display at Fairs	307	1508	20 events	$33,387.12
Educational Projects	1372	23747	133 events	$525,758.58
Forestkeepers	3	14	2 trips	$309.96
Grant Projects	13	42	3 projects	$929.88
Habitat Improvement	707	1894	115 projects	$41,933.16
Inventory	25	25	1 inventory	$553.50
Letters Written (in support of ST issues)	36	43	43 letters	$952.02
Litter Pickups	24207	136518	689 tons of trash	$3,020,648.76
Media Contacts	36	120	29 interviews	$4516.56
Meetings held or attended	1034	1785	1023 attendees	$39,519.90
Mentoring	4	4	5 projects	$88.56
Monofilament Recycling Project	16	48	68 ounces	$1062.72
Other Miscellaneous Projects	239	1903	88 projects	$42,132.42
Planted Trees	598	2832	17297 trees	$62,700.48
Pre-activity Planning	530	2028	427 projects	$44,899.92
Photo Point Monitoring	15	21	80 photos	$464.94
Presentations Given	321	1135	64 presentations	$25,128.90
Rain Garden/Barrel/Green Roof	11	51	5 projects	$1129.14
Recruitment	110	132	114 people	$2922.48
River Observation (possible pollution	12	84	1 project	$1859.76
Stream Access Maintenance	18	83	12 projects	$1837.62
Storm Drain Stenciling	272	1076	711 drains	$23,822.64
Streambank Stabilization	16	377	6 projects	$8346.78
Watershed Mapping	3	45	1 trip	$1062.72
Workshops	417	3505	425 attendees	$77,600.70
Water Quality Monitoring	4406	8616	1211 trips	$190,758.24
Zebra Mussel Monitoring	42	58	20 trips	$1284.12
Totals	35672	191441		$4,238,503.74

Table 21. Number of Volunteer Water Quality Sampling Events Conducted Statewide

Training Level			Monitoring Category	
	Invertebrate	Chemical	Visual	Flow
Intro/1	197	393	251	157
2	125	267	106	115
3	29	64	29	27
4	14	37	10	7
TOTAL	340	719	387	308

Additional information can be found in the Missouri Stream Team Annual Reports: http://www.mostreamteam.org/annreport.asp.

VII. Conclusion: Future Efforts

In FFY2013, an update of the "Key Components of an Effective State Nonpoint Source Management Program" was provided by EPA. In addition, new draft 319 Nonpoint Source Program guidance was finalized will become effective in FFY 2014. Missouri is incorporating these new program guides into a reformed NPS Program and a new Nonpoint Source Management Plan scheduled for completion in calendar year 2014.

Missouri anticipated the need for 319 NPS program reforms and began discussion in 2011 to revise the state's watershed based approach to more efficiently and effectively improve water quality. Key drivers of upcoming state program revisions include: the Department's "Our Missouri Waters Initiative," a reformed collective approach based upon discussion with EPA Region 7, internal Department administrative grant process mapping, and a significantly reformed Nonpoint Source Program Document, fiscal reform, and a more focused approach to NPS issues.

Our Missouri Waters is an effort to move Missouri towards watershed-based management; making decisions while looking at an entire watershed, and not just parts of it. The initiative brings the diverse parts of the Department together to maximize resources and approaches. The three pilot watersheds were selected to demonstrate and evaluate the feasibility of water resource management on a targeted basis Lower Grand River, Big River, and Spring River. The pilots will help the Department develop the necessary infrastructure, policies and procedures to implement this approach across all 66 of the state's HUC-8 level watersheds. Three more watersheds will be prioritized in FFY2014 for Department and partner water quality focus.

In 2012 EPA initiated a Kaizen Effort that consisted of team member representation from the four Region 7 states to evaluate 319 grant processes beginning with the state process for soliciting proposals for 319 projects through award of grant funds to EPA approval of state project implementation plans. The project was completed in FFY2013 and recommendations for how to improve process and timelines were provided to managers, including the 319 NPS Program Coordinator.

In 2012, the Department initiated several mapping processes including one for the 319 processes. The effort has served to provide direction for grants processes in programs throughout the Department. The process mapping helps to: 1) Automate, standardize and understand the process and time required to accomplish specific tasks or sets of tasks. By doing this the NPS Program hopes to provide better service by changing inefficient program and administrative processes; 2) better understand processes, roles, and identify decision points within each process; and 3) improve inefficient fiscal and program related process.

Out of this process, the Process Mapping Team has provided suggestions for improving both fiscal and program task management. There may be further need for policy development or evaluation, preparing for any enhancements, and/or consolidating processes. The team completed the process was completed in May 2013 and a final report provided to the Department Director's Office. These recommendations will help guide the new path forward for the 319 NPS Program. Of particulate not are earlier RFPs and applications for application funds, decreased reviewtimes, and stricter eligibility requirements to receive funds.

Substantial program reform is anticipated consistent with new program guidance, OMW, Kaizen, EPA reform discussions, and process mapping. The new plan will have narrower focus, specific and achievable measures of progress utilizing watershed targeting and high impact or Department priority use of grant funds to improve aquatic life use and habitat.

The Missouri Department of Natural Resources and their resource partners will continue a watershed approach to address nonpoint pollution according to the guidance of Missouri's Nonpoint Source Management Plan. The Department anticipates continued success in the use of funding sources to improve water quality, while concurrently improving upon reporting and evaluation measures of the entire NPS Program partnership will be specified in the Nonpoint Source Management Plan.

Questions regarding this report or other nonpoint source management issues in the State of Missouri should be directed to Greg Anderson, 319 Nonpoint Source Program Coordinator, Missouri Department of Natural Resources, Water Protection Program, P. O. Box 176, Jefferson City, MO 65102, by phone at (573) 751-7144, or by email at greg.anderson@dnr.mo.gov.

VIII. APPENDIX

G13-NPS-05

Schuyler County Well Decommissioning
HUC #07110002

PROJECT DESCRIPTION
The Schuyler County Well Decommissioning project will implement an informational effort to educate the citizens in Schuyler County about ground water contamination that may occur from pollutants entering abandoned water wells that have not been properly closed. Schuyler County Soil & Water Conservation District (SWCD) will produce newsletters, news releases, trifold display, and implement a best management practice (BMP) demonstration, illustrating the proper procedure used to decommission old wells. Overall goal is to get 20 landowners with abandoned wells on their property to properly decommission them through a cost-share incentive program.

OBJECTIVES
- Hold a well decommissioning demonstration to encourage landowners to locate and fill open and unused wells on their property.
- To decommission 20 unused or abandoned wells in Schuyler County through a cost-share program.
- To encourage residents of Schuyler County through newsletter and displays to decommission wells even if no cost-share is available.

METHODS EMPLOYED
- ✓ Cost-share assistance will be provided to landowners to decommissioning 20 abandoned wells.
- ✓ Information/Education - The project and well decommissioning information be provided in the county newspaper and Schuyler County Extension "AGBEAT" newsletter.
  - ✓ A tri-fold display showing well decommissioning will be setup in SWCD office for landowner to view.
- ✓ A well decommissioning demonstration will be held for landowners
- ✓ NRCS will provide design and practice certification
- ✓ University of Missouri Extension will help administer the grant and conduct well decommissioning educational efforts
- ✓ MDC-Private Land Conservationist will help promote the cost-share program
- ✓ **Schuyler County SWCD** will provide a district technician to do the well measuring and design and district manager for assistance with paperwork for site approval, cost- share, and DNR registration.

COOPERATING AGENCIES
University of Missouri Extension, Natural Resources Conservation Service (Schuyler and Putnam counties), Missouri Department of Conservation (Scotland, Schuyler, and Putnam counties), and Schuyler County SWCD

CONTACT
Project Manager: Darrell L. Kearse
Schuyler County SWCD
P.O. Box 249
Lancaster, Missouri 63548
(660) 457-3715
Darrell.kearse@swcd.mo.gov

MDNR Project Manager: John Johnson
Minigrant #: G13-NPS-05
Project Period: September 15, 2012 – September 14, 2014
FY08-09 319 Grant: $10,000
Match: $6,667
Total funding: $16,667

G11-NPS-08

Belews Creek Watershed Management Plan Implementation

Jefferson County Stormwater Management Division

Project Description

The Belews Creek watershed (HUC #07140104080007) covers 26 square miles (16,500 acres) in central Jefferson County, is a stream order five tributary to the Big River, which is on the 303(d) list for lead impairment. The Belews Creek Watershed Management Plan Implementation project intends to improve the water quality in the watershed through the implementation of tasks identified in the accepted watershed management plan.

Objectives

1. To increase public awareness of the Belews Creek Watershed and improve public participation in maintaining the watershed;
2. To educate residents on waste management system issues and offer a cost-share pumpout program;
3. To increase riparian corridor along Belews Creek, leading to improved water quality and wildlife habitat;
4. To reduce sedimentation in Belews Creek with streambank stabilization projects, and to eliminate cattle from the creek;
5. To educate residents about sinkholes and offer cost-share for best management practices to protect them; and
6. To create a bio-retention and storm water management demonstration area behind the Jefferson County Administration Building, eliminating an erosion issue and developing a rain garden and outdoor education area.

Methods Employed

- ✓ Workshops on low impact development, on-site waste management systems, karst/sinkhole issues/riparian corridor improvements, streambank stabilization
- ✓ Manuals for on-site waste management systems
- ✓ Electronic photo journal submitted to DNR
- ✓ Public Meetings, PSAs, press releases, newsletter articles, website updates
- ✓ Presentations (4)
- ✓ Quarterly, Annual and Final Reports

Cooperating Agencies

Jefferson County Highway Department
Department of Conservation
Missouri Stream Team
Local Community Organizations

Contact

Ms. Kristi Bales, Jefferson CO Stormwater Management
725 Maple Street, P.O. Box 100
Hillsboro, MO 63050
E-mail: kbales@jeffcomo.org
Ph: (636) 797-6455
Mr. Mark Wiley, Belews Creek Watershed Partnership
9500 Hwy "BB"
Hillsboro, MO 63050
E-mail: mwwiley@zakcompanies.com
Ph: (314) 220-3425

Project Manager: Valerie Hentges
Subgrant #: G11-NPS-08
Project Period: 4/1/2011 – 3/31/2015
FY08-09 (Base) 319 Grant: $180,200
Match: $120,133
Total federal funding: $300,333

G13-NPS-06

Missouri Clean Marina Program – Upper White River Basin Pilot Program
Upper White River Basin Foundation

After visiting marinas in coastal areas and attending national marina conferences that showcased the "Clean Marina" program, local interest from marina owners on Table Rock Lake sparked the concept for a Missouri focused program.

Project Description
The "Missouri Clean Marina" program will be modeled from coastal programs that work to reduce the amount of nonpoint source pollution entering into coastal waterways from marina operations. This concept will be used to create a pilot program focused on lakes within the Upper White River Basin watershed with emphasis on Table Rock Lake. This program will give marina owners the opportunity to take action in a voluntary program that reduces their impact on water quality while educating boaters and the community of their stewardship efforts. The goal is to enroll at least ten marinas and use this pilot program as a catalyst in making the "Missouri Clean Marina" program a statewide initiative.

Objectives
Project Objective: The "Missouri Clean Marina" program will give marina owners the opportunity to take action in a voluntary program that reduces their impact on water quality while educating boaters and the community of their stewardship efforts.

The main objectives of this program are:
1. Develop a "Missouri Clean Marina" program that marinas can join to act as part of a voluntary, self-regulating effort to reduce nonpoint source pollution.
2. Develop "Missouri Clean Marina" requirements that when implemented at participating marinas educate boaters, patrons, and community on nonpoint source issues and reduce the impact of potential nonpoint source pollution.

Methods Employed
- ✓ A "Missouri Clean Marina" program will be developed and will include the following publications to be disseminated to all marinas within the Upper White River Basin watershed:
  - ❖ Promotional educational brochure/pamphlet about the "Missouri Clean Marina" program
  - ❖ "Missouri Clean Marina" program application for each participating marina
  - ❖ "Missouri Clean Marina" guidebook
  - ❖ "Missouri Clean Marina" checklist
  - ❖ "Missouri Clean Marina" pledge
  - ❖ "Missouri Clean Marina" renewal form
- ✓ Three Advisory Committee meetings
- ✓ Minimum of 10 marinas will be enrolled in the "Missouri Clean Marina" program
- ✓ 3,000 boaters and marina patrons will gain increased awareness of nonpoint source issues
- ✓ General public will gain increased knowledge of nonpoint source issues with media coverage and website regarding program. Media coverage will be obtained through press releases to reach an approx. viewership/readership of 100,000
- ✓ Document project success through photo journal
- ✓ Quarterly, Annual, and Final Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports

Cooperating Agencies
U.S. Army Corps of Engineers – Table Rock Lake; Table Rock Lake Marina Association; Ozarks River Heritage Foundation; Missouri Stream Team Watershed Coalition

Contact
Project Manager: Ronna Haxby
Authorized Representative:
David Casaletto; Executive Director
Upper White River Basin Foundation
PO Box 636
Kimberling City, MO 65686
(417) 739-5001
Email address: ronna@ozarkswaterwatch.org

Project Manager: Valerie Hentges
Minigrant #: G13-NPS-06
Project Period: October 1, 2012 – December 31, 2013
FY08-09 319 Grant: $10,000
Match: $6,670
Total federal funding: $16,670

G10-NPS-04

Lakes of Missouri Volunteer Program

University Of Missouri – Columbia

Project Description

The Lakes of Missouri Volunteer Program (LMVP) is an ongoing project that uses citizen monitors to collect water samples and water quality data from Missouri lakes. Volunteers are supplied with equipment and training needed to collect and process lake water samples. The sample season runs from April through September, with sample collection occurring every three weeks, for a total of eight samples each year. While on the lake, volunteers take surface temperature and Secchi transparency readings. The composite consists of three grab samples from the surface of the lake. LMVP staff analyzes the samples in the Limnology lab of the University of Missouri – Columbia. Once all of the lake samples are analyzed, the data are compiled and reported to the regulatory agencies. The data are also used to create an annual Data Report. During the spring of each year LMVP staff holds regional data review meetings. Data Reports for the previous season are distributed and the LMVP staff reviews the findings with the volunteers, agency personnel and public who attend the meetings.

Objectives

The ongoing objectives of the LMVP are to:

1) determine water quality of Missouri lakes;
2) monitor for long-term changes in water quality;
3) educate the public about lake ecology and water quality issues.

Methods Employed

- ✓ Quality Assurance Project Plan
- ✓ Annual Data Report
- ✓ Website maintained quarterly
- ✓ 2 newsletters per year
- ✓ Power point presentations to interested civic groups
- ✓ Regional data reviews
- ✓ Niangua Sampling Event (2010 – 2011)
- ✓ Watershed-wide snapshot sampling (TBD; 2012-2013)
- ✓ Recognition and incentives for volunteers contributing more than 5 years.
- ✓ Electronic copy of raw data submitted to MDNR
- ✓ Quarterly, Annual and Final Reports

Cooperating Agencies

University of Missouri – Columbia
Missouri Department of Conservation

Contact

Dr. Jack Jones and Anthony Thorpe
University of Missouri - Columbia
302 A.B. Natural Resources Building
Columbia, MO 65211
(573) 882-3543

Project Manager: Valerie Hentges
Entered in GRTS:
Project Period: 9/1/2010 – 8/31/2013

Total federal funding	$ 610,685
Match	$ 244,274

G13-NPS-04

Mill Creek Nonpoint Source Pollution Education and Engagement Program
Missouri Stream Team Watershed Coalition

What makes the Mill Creek vision so exciting is the potential to significantly enhance the watershed and quantify the impact on the water to ultimately deliver a high-quality educational grant about nonpoint source pollution. This vision is enhanced by a combination of success factors including: a) landowner involvement, b) the quality, quantity and proximity of resources, c) obtaining "Priority Watershed" status from the US Forest Service (FS) and Missouri Department of Conservation (MDC), d) FS and MDC owning 61% of the watershed and e) the watershed being a manageable size (29,000 acres) with only 10 residents per square mile.

Project Description
The project will create the opportunity to educate and inspire participation towards the reduction of nonpoint source pollution and prevention in the Mill Creek watershed. To achieve this goal the project will build an educational website, create a documentary film of at least 10 minutes, design an active learning brochure, and finally, continue collaborative efforts with various organizations. Together these would provide nonpoint source (NPS) pollution education across a broad communication spectrum to fit a wide variety of audiences and needs.

Objectives
Project Objective: Increase the NPS pollution awareness, outreach, and education in the Mill Creek Watershed and beyond:

1) An educational website that identifies and illustrates NPS pollution issues (e.g., sediment, nutrients, bacteria) and current water quality data in the Mill Creek watershed. This website will provide resources for concerned citizens wanting to help restore or protect their watershed.
2) Produce a documentary film, about 10 minutes in length, that illustrates the importance of NPS prevention or best management practices that can easily be incorporated into the landscape, highlighting the importance of water quality by the unique aquatic organisms in the creek, and other NPS educational topics.
3) Create an action-based learning brochure focused on NPS pollution prevention.
4) Through the above objectives (i.e., website, documentary film, and educational brochure) several educational outreach events and continuous collaboration with other organizations and partners will occur as time allows.

Methods Employed
- ✓ Educational website with multiple web pages
- ✓ Documentary film (at least 10 minutes)
- ✓ At least one action based learning brochure
- ✓ Host educational & outreach events as time allows
- ✓ Continue collaboration with various partners
- ✓ Document project success through photo journal
- ✓ Quarterly Reports/Annual Reports/Final Report
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports

Cooperating Agencies
Mill Creek Watershed Coalition, Mill Creek landowners, Audubon Society – Missouri, Conservation Federation of Missouri, Ozark Fly Fishers, Ozark Trail Association, University of Missouri Science and Technology, AmeriCorps – St. Louis

Contact
Project Manager: Holly Neill
Authorized Representative: Larry Ruff, Board President
Missouri Stream Team Watershed Coalition
PO Box 2132
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Project Manager: Valerie Hentges
Subgrant #: G13-NPS-04
Project Period: September 1, 2012 – August 31, 2014
FY08-09 319 Grant: $10,000
Match: $6,670
Total federal funding: $16,670

G11-NPS-05

Improving Nonpoint Source Pollution Education Through Project WET

Missouri State University

Project WET (Water Education for Teachers) is a statewide program which will improve upon and ensure a consistent and well-established method of instruction in water-related education targeting nonpoint source pollution.

Project Description

Project WET is a water quality education curriculum. A total of fifteen Project WET workshops will be offered to match the water quality concerns of each focus impaired watershed. Additionally, one Facilitator training will be offered each year to increase the number of facilitators across the state. Facilitators are trained to lead Project WET workshops and train new educators. This will increase the number of educators and keep the water education of our citizens increasing over time. In addition, one advanced in-state facilitator training and one 4-state advanced training per year with other facilitators from Arkansas, Oklahoma, Kansas and Missouri will be offered to experienced facilitators to increase their background knowledge.

Objectives

1. To train non-formal educators (SWCD, State Parks, MDC, MDNR, etc.) and classroom teachers to use Project WET activities in their programs and classrooms to raise awareness of nonpoint source pollution issues in Missouri (15 statewide workshops);
2. To strengthen the Project WET Facilitator network by providing facilitator training opportunities, advanced training opportunities, and incentives for conducting workshops. Project WET facilitators are volunteers and providing these items helps energize the Facilitator network and in turn, they schedule more workshops than the fifteen listed above; and
3. To increase nonpoint source pollution education of students and non-formal audiences through better training of educators. If teachers are more comfortable with the information and with education materials they are more likely to use the materials with their students.

Methods Employed

- ✓ Workshops to train teachers
- ✓ Workshops to provide training to Facilitators
- ✓ Workshops to provide advanced training to Facilitators
- ✓ Quarterly, Annual and Final Reports
- ✓ Pre-/Post-surveys of workshop attendees
- ✓ Presentations

Cooperating Agencies

Missouri State University - Springfield
National Project WET
Missouri Department of Conservation Education Consultants
University of Missouri – Extension Service
MO Stream Team Watershed Coalition
Missouri Department of Natural Resources
Watershed Committee of the Ozarks

Contact

Erica Cox, Aquatic Education Specialist, MSU
State Project WET Coordinator
901 S. National Avenue
Springfield, MO 65897
417.836.4337
Ericacox@missouristate.edu

Project Manager: Valerie Hentges
Subgrant #: G11-NPS-05
Project Period: 4/1/2011 – 12/31/2014
FY08-09 319 Grant: $103,759
Match: $69,176
Total federal funding: $172,935

Implementing Total Maximum Daily Loads through Locally Developed Watershed Management Plans

(Statewide and Targeted Project)

PROJECT DESCRIPTION


State Training on 9-element plan development

University of Missouri (MU) Extension continued efforts began in an earlier subgrant effort that includes watershed group assistance and development of watershed based plans, in addition to laying a foundation for implementing nonpoint source TMDLs. Special technical assistance is provided in performing watershed assessments, load determinations, load reductions, and prioritizing WMP implementation schedules to ensure that projects implemented will reduce the impairment of the water body. MU Extension was available to assist in other various watersheds that may not be targeted for TMDLs as prioritized by the Department of Natural Resources. The project scope was modified to allow MU to provide greater support for the Departments Our Missouri Waters Initiative. The project was successfully completed in February 2013 but the partnership continues in the UMC Watershed Assistance Joint Funding Agreement.

OBJECTIVES

1. **Watershed Planning in TMDL or other priority watersheds.** Work with nonprofits, institutes of higher education, and governmental units to refine and provide detail to the implementation schedule of Department accepted 9-element watershed management plans to prepare applicants for funding under Department Requests for Proposals for 319 grant funded projects.
2. **Assist existing groups** in Department identified priority watersheds with development of nine element watershed plans that are of sufficient quality to be accepted by the Department.
3. **New watershed group formation.** Help to form and foster new watershed groups in priority watersheds as defined and requested by the Department.
4. **Conferences and General Info/Ed.** Provide an annual watershed conference and regional workshops that focus on group experience, planning methodology, and training on watershed planning.


BMP site selection for urban subgrant

METHODS EMPLOYED

- ✓ Ensure technical information provided to watershed planners is based upon sound science.
- ✓ Provide all written materials and presentations to the Department's project manager for review and approval of content and proper credit language.
- ✓ Provide continuing professional guidance and technical support throughout the duration of the project, with timely input to the Department and making necessary modifications as required to the process. Technical support provided will include training and assistance with watershed assessment, critical areas, pollutant load determination, and pollutant load reduction.
- ✓ Promote nine-element watershed planning by identifying existing groups in priority watersheds and assisting with the completion of Department acceptable nine element watershed plans.
- ✓ Help to form and foster new watershed groups in priority watersheds as defined by the Department.
- ✓ Plan and host an annual watershed conference for watershed groups and Department personnel, which highlights watershed planning, related tools and resources, watershed group experiences and suggestions, and appropriate demonstrations and workshops.
- ✓ Host regional workshops that focus on group experience, planning methodology, and training.
- ✓ Complete reporting as required by the Department.

COOPERATING AGENCIES

Missouri Department of Natural Resources and University of Missouri Extension

CONTACT

Project Manager: Bob Broz, Investigator
Water Quality Program
University of Missouri Columbia
205 Agricultural Engineering Building
Columbia, MO 65211
(573) 882-008

Email address: brozr@missouri.edu
MDNR Project Manager: Greg Anderson
Project Period: March 1, 2011 – February 28, 2013

FY05 and 06 319 Grants:	$197,715
Match:	$131,823
Total funding:	$329,538

Our Missouri Waters, Spring River Watershed Plan,
And other Department Prioritized Watershed Needs
(Statewide and Targeted Project)

PROJECT DESCRIPTION


Spring River Watershed Tour

The "Our Missouri Waters" (OMW) initiative began by prioritizing three pilot watersheds (Lower Grand River, Big River, and Spring River) for this holistic watershed based approach to improving water quality. Implementing this significant watershed-based effort requires multiple partners. UM-AE has the capabilities to assist the Department with a portion of responsibilities that will fall upon the state. An agreement between UM-AE and the Department results in a professional assistance and partnership to move the OMW initiative forward. The agreement will help the Department develop the necessary infrastructure, policies and procedures to implement the "Our Missouri Waters" approach across all 66 of the state's HUC-8 level watersheds" (OMW Webpage, http://www.dnr.mo.gov/omwi.htm). Additional watersheds efforts will be launched and prioritized after the first three get underway. The Spring River watershed planning effort involves multiple partners but three major contributors were identified to create a nine element watershed based plan. A major role is envisioned for UM-AE to assist with stakeholder facilitation, agricultural outreach, and watershed information gathering.

OBJECTIVES

1. Provide technical support relating to: training, critical areas, meeting facilitation, workgroup participation or leadership, agriculture, OMW summit logistics and organization.
2. Assist Kansas State University and Harry S. Truman Coordinating Council in the development of a high quality 9-element watershed based plan.
3. Promote agricultural practices, nine-element planning, and landowner commitments to implement best management practices (BMPs) in OMW areas.
4. Plan and host the annual NPS watershed conference for watershed groups and Department personnel, which highlights watershed planning, OMW, related tools and resources, watershed group experiences, and workshops.
5. Assist with three OMW watershed summits, which may include logistics, facilitation, training, and coordination.


Big River Watershed Summit

METHODS EMPLOYED

- ✓ Ensure technical information provided to watershed planners is based upon sound science.
- ✓ Provide all written materials and presentations to the Department's project manager for review and approval.
- ✓ Provide continuing professional guidance and technical support throughout the duration of the project, with timely input to the Department and making necessary modifications as required to the process. Technical support provided will include training and assistance with watershed assessment and identifying critical areas.
- ✓ Promote nine-element watershed planning by identifying existing groups in priority watersheds and assisting with the completion of Department acceptable nine element watershed plans.
- ✓ Help to form and foster new watershed groups in priority watersheds as defined by the Department.
- ✓ Plan and host an annual watershed conference for watershed groups and Department personnel
- ✓ Assist with OMW Summits and launching watershed initiatives by conferring with the project manager and the OMW Coordinator.

COOPERATING AGENCIES

Missouri Department of Natural Resources, University of Missouri Extension, Harry S Truman Coordinating Council, and Kansas State University.

CONTACT

Project Manager: Dan Downing, Investigator
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205 Agricultural Engineering Building
Columbia, MO 65211
(573) 882-008
Email address: brozr@missouri.edu

MDNR Project Manager: Greg Anderson
Project Period: March 1, 2011 – February 28, 2013

FY05 and 06 319 Grants:	$197,715
Match:	$131,823
Total funding:	$329,538

G11-NPS-13

Operation Brightside Demonstration Garden and Learning Center
Operation Brightside, St. Louis, MO

Project Description
Operation Brightside is a not-for-profit organization in St. Louis with a mission of restoring, maintaining, and growing the community landscape by leading cleaning and greening initiatives. This site will allow for the community to compare the implemented LID and BMPs for greater adaption.

Objectives
1. Redevelop a vacant lot into a demonstration garden and learning center site incorporating several LID and BMPs.
   - LID practices for inside and beside the demo garden: porous concrete, pervious asphalt and permeable pavers.
   - LID practices in front of Operation Brightside Headquarters: silva cells with trees and permeable pavers.
   - BMPs for the demo garden: bio-retention cell and rain garden, bio-swale, native plantings, rain barrels, and cistern.
2. Provide at least eight educational workshops to community residents, students, neighborhood leaders, and government officials.
3. Offer four CEC classes for urban planners, architects, engineers, and developers to increase knowledge of LID/BMPs for an urban landscape.
4. Create independent learning opportunities with interpretive signage and a brochure.
5. Construct a literature kiosk in the demonstration garden and learning center to display publications provided by partners to educate visitors about LIDs and BMPs. Visitors will be able to take publications with them to implement LID practices at home or in their neighborhood.
6. Work with other agencies and organizations in the area (e.g., East-West Gateway and Tower Grove Heights) to promote LIDs and BMPs.
7. Inform community of project progress and awareness though news releases, website updates, online photo updates, and additional media forms as appropriate.

Methods Employed
- ✓ Eight LIDs and BMPs in the demonstration garden and learning center
- ✓ Eight educational workshops for community residents/students, neighborhood leaders, and government officials
- ✓ Four continuing education credit classes for urban planners, architects, engineers, etc.
- ✓ Updated webpage on project progress
- ✓ Interpretive signage and informational kiosk
- ✓ Quarterly, Annual, and Final Report(s)

Cooperating Agencies
Missouri Department of Conservation
St. Louis Metropolitan Sewer District
Alberici Constructors
St. Louis Master Gardeners
City of St. Louis
Missouri Botanical Garden
SWT Design

Contact
Project Manager: Mary Lou Green
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Project Manager: Valerie Hentges
Subgrant #: G11-NPS-13
Project Period: April 1, 2011 through March 31, 2014

FY08-09 319 Grant:	$ 105,400
FY04 319 Grant:	$113,000
Match:	$145,600
Total project funding:	$364,000

G10-NPS-03

Statewide Lake Assessment Project
Statewide project

PROJECT DESCRIPTION

This statewide assessment will include lake-watersheds that represent the continuum of size and land cover conditions within Missouri. The project continues to expand the historic data set on Missouri reservoirs by collecting water quality data from ~75 lakes across the state. Each Spring, selected lakes represent the full range of size, use, and geographical location in Missouri. Continued sampling of these primary lakes provides a "statewide baseline" of water quality data which allows for the identification of large scale regional trends. Assessment will occurs each summer, with each sampling circuit lasting three weeks (period required to collect one sample from each lake, about 25 per week). This schedule is repeated four times so that water quality during the summer season is documented. Parameters measured include total nitrogen, total phosphorus, algal chlorophyll, total suspended solids (measure of sediment), turbidity, conductivity, and dissolved organic carbon.

OBJECTIVES

1) Determine the current water quality of Missouri's lakes.
2) Quantify the factors regulating water quality in Missouri's lakes.
3) Monitor for long-term changes in water quality in individual lakes.

Products

1) Update Quality Assurance Project Plan (QAPP)
2) Annual data set to be supplied to the Department (~75 lakes per year)
3) Invoices and Quarterly Reports (includes an annual list of lakes to be sampled)
4) Individual lake reports written and supplied to Lake Associations or managing agency (MDC) upon request (reviewed and approved by Department Project Manager)
5) Outreach efforts will include contributing to the Water Line Newsletter, Lake Association Data Reports and conducting presentations on lake ecology and water quality (Water Quality Short Course training, Columbia Aquatic Restoration Project, etc.). Planned outreach efforts will be submitted to the Department Project Manager prior to the event and approved.
6) Annual Report to Department
7) Interim FY Final Reports and Overall Final Report

Data is provided to the Department with the March Quarterly Report for use in the 305(b) report and 303(d) List. Data is also provided upon request to research scientists, MDC staff and lake associations.

COOPERATING AGENCIES

University of Missouri, Department of Fisheries and Wildlife Sciences
Missouri Department of Conservation
Missouri Department of Natural Resources
Environmental Protection Agency Region 7

CONTACT

University of Missouri
Dr. Jack Jones and Daniel V. Obrecht
302 ABNR Building
Columbia, MO 65211
Phone: (573) 882-3543

DNR Project Manager: Valerie Hentges
Project Period: 09/01/2010 – 08/31/2014

Total federal funding	$ 582,373.00
Match	$ 232,949.00

G12-NPS-09

St. Louis Earth Day Symposium
(Regional Project)

PROJECT DESCRIPTION

The intent of the St. Louis Earth Day Symposium 319 grant is to provide educational and networking opportunities for local government officials, community leaders, and professionals from diverse backgrounds in the planning and environmental fields. For twelve years the St. Louis Earth Day Symposium has highlighted new ideas and increased discussion about regional water quality/water pollution/stormwater management issues. The St. Louis Earth Day Symposium provides good information and data that is needed to drive successful watershed planning.

OBJECTIVES

1. To share best practices for ecologically sensitive approaches to infrastructure development.
2. To utilize ecologically significant data in local and regional planning.
3. Translate environmental issues and sustainable practices into locally applicable solutions.
4. Watershed planning for improved water quality and ecologically-sound stormwater management.
5. Identify key leadership in applied watershed management research and bring them to St. Louis to share their expertise.
6. Reach representatives of at least 20 local government entities in the greater St. Louis region with practical applications of nonpoint source pollution reducing tools and techniques; reach at least 50 consultants of area governments with technical information that will enhance their ability to deliver stormwater management and pollution-prevention services to local governments.
7. Educate local government officials, developers, and consultants about the importance of reducing nonpoint source pollution.
8. Inspire collaboration among local governments to develop watershed plans and regulations to prevent water pollution.
9. Focus the attention of local governments, developers and the consultants who work with them, on low cost strategies to improve water quality.
10. Encourage creative approaches to address water quality challenges.
11. Engage new attendees in using new technology in their watershed planning.
12. Promote an innovative and diverse vision for watershed-based approaches to policy and planning.
13. Introduce new modeling techniques and processes and new GIS tools for watershed planning.

METHODS EMPLOYED

- ✓ Follow up survey/evaluation to all attendees
- ✓ Polling of the Symposium Planning Committee
- ✓ Internal event report
- ✓ Public event report posted on website
- ✓ Website announcements
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

American Society of Civil Engineers, American Society of Landscape Architects, Greenway Network, Horticulture Co-op of Metro St. Louis, Metropolitan St. Louis Sewer District, Missouri American Water, Missouri Botanical Gardens, Missouri Department of Conservation, Missouri Department of Natural Resources, Missouri Department of Transportation, SCI Engineering, The Confluence, East-West Gateway Council of Governments, U.S. Army Corp of Engineers

CONTACT

Project Manager: Cassandra Hage,
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St. Louis Earth Day
4168 Juniata St.
St. Louis MO 63116
(314) 616-7354
Email address: cassie@stlouisearthday.org

MDNR Project Manager: Greg Anderson
Project Period: March 1, 2012 – February 28, 2014

FY08-09 319 Grant:	$10,000
Match:	$12,915
Total federal funding:	$22,915

G06-NPS-26

Mercury Deposition Network

National Atmospheric Deposition Program

PROJECT DESCRIPTION

The Mercury Deposition Network (MDN) is a network of states and Canadian Provinces that sponsor over 50 precipitation collection sites scattered across North America. The objective of the MDN is to develop a national database of weekly concentrations of total mercury in precipitation and the seasonal and annual flux of total mercury in wet deposition. The MDN supplies the States with scientifically sound, consistent and comparable national data. MDN uses an accepted method for direct measurement of total mercury wet deposition that is suitable for routine collection. MDN supplies spare parts and technical support to each location and routinely audit all MDN sites to assure compliance with quality assurance/quality control procedures. The Environmental Services Program (ESP) also provides technical support in the setup and maintenance of Missouri's MDN station. The Air Pollution Control Program (APCP) aids the WPP in analysis of the data as well as tracking the sources of atmospheric mercury. The APCP will also play a critical role in implementing the Total Maximum Daily Load (TMDL) within Missouri.

The MDN uses the data to develop information on spatial and seasonal trends in mercury deposited to surface waters. The Missouri Department of Natural Resources will use the data and models in developing a TMDL and in policy discussions regarding control of mercury emissions.

OBJECTIVES

1) The department will continue operation of the Mingo National Wildlife Refuge mercury deposition collection station.
2) The department will enhance the mercury deposition network data for Missouri by adding a mercury deposition collection station at the University of Missouri – Columbia's (UMC) Baskett Research & Education Area (BREA) near Ashland.

METHODS EMPLOYED

- ✓ MOA with University of Illinois
- ✓ Contract with UMC
- ✓ Quarterly invoicing
- ✓ Quality Assurance Project Plan
- ✓ Data posted and retrieved via MDN Internet site

COOPERATING AGENCIES

University of Missouri – Columbia
National Atmospheric Deposition Program
University of Illinois – Illinois State Water Survey

CONTACT

Project Manager: David Gay
University of Illinois – Illinois State Water Survey
2204 Griffith Dr.
Champaign, IL 61820-7495

MDNR Project Manager: Amanda Sappington/Valerie Hentges
Subgrant #: G06-NPS-26
Project Period: July 1, 2010 – June 30, 2013
FY06 319 Grant: $66,432
Total funding: $66,432
Project Period: July 1, 2013 – June 30, 2016
FY11 319 Grant: $59,532
Total funding: $59,532

G08-NPS-01

Jefferson Farms Water Quality Demonstration Project
HUC 10300102

PROJECT DESCRIPTION

The project is located in the Hinkson creek watershed, which is approximately 57,500 acres, and is currently on the state's 303(d) list of impaired waters. This project focuses on the development of a 67-acre farm. The Jefferson Farm site will demonstrate sustainable agriculture practices including livestock pasturing, row crops, specialty crops, and turf grass management.

The newly created Jefferson Farms facility in the Hinkson Creek watershed will showcase a suite of best management practices (BMPs) to reduce surface runoff from urban and agricultural sources. The facility will include a variety of agricultural, horticultural, and conservation components, with an emphasis on environmental-friendly land management. Practices include the use of riparian buffers, constructed wetlands, bioswales, and rain gardens, as well as permeable paving technologies. The indoor facility will include a visitor center with teaching areas, and exhibit hall with interactive exhibits and classrooms. The project will reduce agricultural runoff, demonstrate BMPs, develop and conduct tours, workshops and 5th-grade curriculum, and implement producer education programs in methods to reduce surface runoff. The 319 funding will be used to install and monitor BMPs to reduce erosion and chemical runoff from pesticides, fertilizers and animal wastes.

OBJECTIVES

1. To reduce runoff from public parking surfaces through the demonstration of permeable pavement, bioswales and (2) rain gardens.
2. To reduce agricultural runoff from cropland and pasture areas through use of constructed wetland buffers, vegetative covers and riparian buffers with grass filter strips.
3. To conduct extensive public education programs on water quality, incorporating site demonstrations, tours, workshops and youth curricula.
4. To implement producer education programs to train farmers and other landowners in methods of improving water quality through reduced surface runoff.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan development
- ✓ Samples in post-rainfall periods and analyzing water samples for nutrients and other factors
- ✓ Electronic copy of raw data submitted to MDNR
- ✓ Installation of two (2) rain gardens
- ✓ Parking lot construction using Advanced Paving System brick pavers
- ✓ Wetland development and buffers
- ✓ Construct overflow parking lot using a combination of permeable asphalt and grasspavers
- ✓ Quarterly, Annual and Final Reports
- ✓ 2 rain gardens
- ✓ Written and verbal surveys to evaluate success
- ✓ BMP tours

CONTACT

Project Manager: Lorin Chann
Authorized Representative: Dr. Jerry Nelson
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MDNR Project Manager: John Johnson
Subgrant #: G08-NPS-01
Project period: February 15, 2008 – January 21, 2013

FY06 319 Grant:	$188,000
FY02 319 Grant:	$78,000
Match:	$182,000
Total funding:	$448,000

G08-NPS-06

North Fabius Water Quality Improvement Project
HUC #07110002

PROJECT DESCRIPTION
This North Fabius Water Quality Improvement project is addressing the three main water quality problems in the North Fabius River watershed: sediment, chemical runoff, and animal waste. The main sources of sediment here are unimproved pastures, cropland, and streambank erosion caused by livestock watering. Chemical inputs are primarily from conventional cropland or commercial horticulture operations; animal waste sources include cattle in the stream, feedlots, and a 2400-head confined hog feeding operation.

OBJECTIVES
- Reduce sheet and rill erosion and control pests on cropland.
- Demonstrate stream water quality benefits by manure distribution and maintain vegetative cover on pastureland.
- Demonstrate water quality and soil conservation benefits by excluding livestock from streams through the construction alternative watering sources and livestock use exclusion areas.
- Reduce erosion by decreasing sediment, nutrient, and chemical runoff through the installation of riparian vegetative buffers.
- Reduce sediment delivery into the river and its tributaries by construction of terraces and dry hole systems/sediment basins.
- Reduce chemical and animal waste runoff through proper application of lime and fertilizer.
- Control animal waste runoff and increase infiltration.
- Reduce streambank erosion by demonstrating spring developments.
- Prevent groundwater contamination by decommissioning abandoned water wells.
- Incorporate information from best management practice (BMP) implementation into the watershed management plan.

METHODS EMPLOYED
- ✓ Use RUSLE2 model to estimate BMP soil loss
- ✓ Collection of water quality samples from the North Fabius River
- ✓ Use educational events to document public knowledge and interest in nonpoint source pollution and water quality
- ✓ Surveys and evaluation participants and attendees at demonstrations and workshops
- ✓ Implement a landowner/participant survey to gauge increase in knowledge of water quality
- ✓ Install 11 alternative watering sources/use exclusion system
- ✓ Decommission 35 abandon wells
- ✓ Install 10 miles of riparian buffers
- ✓ Completed 4 planned grazing systems
- ✓ Complete 20 dry sedimentation basins
- ✓ Install 1 animal waste facility
- ✓ Quarterly, Annual and Final Reports
- ✓ Spencer Lake erosion control project
- ✓ 40 acres Pasture and Hayland Improvement

COOPERATING AGENCIES
USDA Natural Resources Conservation Service, University of Missouri-Columbia Extension, Missouri Stream Team

CONTACT
Project Manager: Darla Campbell
University of Missouri Extension
Authorized Rep: Edgar Berry, Chairman
Schuyler County Soil & Water Conservation District
P.O. Box 249
Lancaster, Missouri 63548
(660) 457-3469

MDNR Project Manager: John Johnson
Subgrant # G08-NPS-06
Project Period: March 1, 2008 – August 31, 2013

FY06 319 Grant:	$477,162
FY07 319 Grant:	$65,932
Match:	$ 0
Total Funding:	$543,094

G08-NPS-14

Northwoods - Baden Creek Bank and Water Quality Stabilization
HUC # 11010002

PROJECT DESCRIPTION

The Baden sub-watershed encompasses 426.3 acres in the city of Northwoods located in north St. Louis County. Baden Creek has been the site of nonpoint source pollution in the form of sedimentation from creek bank erosion and storm water runoff. The project is evaluating the existing conditions of the stream to generate recommendations for improvements to Baden Creek to reduce erosion, improve water quality, control localized flooding where possible, and educates citizens on the destructive nature of nonpoint source pollutants on the creek environment and to residential property. The project has completed a detailed assessment of the stream and conducted a geomorphic study to identify the areas where best management practices (BMPs) are needed to improve the stream water quality. Storm water and stream stabilization practices are being implemented in the critical areas of the watershed

OBJECTIVES

- Complete a geomorphic study to determine specific stream problems and identify practical solutions
- Implement education programs to educate the local residents about nonpoint source and water quality
- Implement stream and storm water BMPs in the critical area of the watershed
- Increase by 20% resident participation in implementing storm water BMPs
- Hire a Project Manager to coordinate implementation of all aspects of the Baden Creek Project
- Promote riparian buffer and/or vegetative filter strip along Baden Creek where appropriate

METHODS EMPLOYED

- ✓ Complete a geomorphic study of Baden Creek
- ✓ Implementation of practical resolutions where the worst stream problems are occurring
- ✓ Develop a project website and newsletter
- ✓ Implement a telephone announcement system
- ✓ Hold Town Hall meetings for the residents
- ✓ Install "Resident Participation" Yard Signs on participating residents
- ✓ Conduct an annual evaluation of sedimentation reduction and creek bank erosion
- ✓ Develop quarterly, annual and final reports of 319 project results

COOPERATING AGENCIES

Metropolitan St. Louis Sewer District, Missouri Department of Conservation, St. Louis County Health Department, Reitz and Jens, Inc., Intuition and Logic, St. Louis University-Region Wise College of Public Service

CONTACT

Project Manager: Lillian D. Eunice
City Administrator
Authorized Representative:
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4600 Oakridge Blvd
Northwoods, Missouri 63121
Phone: (314) 385-8000/Fax: (314) 385-8144
E-Mail: leunice@cityofnorthwoods.com
MDNR Project Manager: John Johnson

Subgrant: # G08-NPS-14
Project Period: April 1, 2008 – July 14, 2014

FY06 319 Grant:	$ 611,321
FY07 319 Grant:	$3,100
FY11 319 Grant:	$356,900
Match:	$ 647,568
Total funding:	$1,618,889

G09-NPS-03

Upper Shoal Creek On-Site System Implementation
HUC 11070207

PROJECT DESCRIPTION

The Upper Shoal Creek On-Site System Implementation Project is targeting homeowners nearest Shoal Creek and its tributaries to carry out septic system clean-outs, repairs, and replacement practices. Interested parties within the target area, receives an assessment of their on-site system to identify problems and determine which practice should be conducted. Homeowners are also advised on other practical best management practices (BMPs) (e.g., livestock exclusion, manure handling) to implement on their property. Each homeowner that participates in the repair, replacement, and pump-out programs will have the opportunity to sample their private drinking well water to ensure bacterial contamination has not occurred. A nine (9) element watershed management plan for Upper Shoal Creek will also be developed in the project.

OBJECTIVES

- Complete a 9-element watershed management plan;
- Repair or replace approximately 30 septic systems;
- Pump out 40 septic systems;
- Promote project and educate watershed residents through targeted landowner events, direct mailings, educational materials, newspaper articles, radio programs, community contacts, and annual field demonstration days;
- Provide educational materials to residents in target watershed areas;
- Survey residents to assess knowledge, attitude and behavioral changes;
- Test 50 drinking water wells for bacteria contamination;
- Develop a water quality sampling plan and Quality Assurance Project Plan;
- Monitor water quality of the Upper Shoal;
- Develop a GIS database to track water quality and BMPs; and
- Report load reductions for bacteria.

METHODS EMPLOYED

- ✓ Targeted landowner meetings
- ✓ Homeowner site assessments
- ✓ Pre- and post-surveys
- ✓ On-site system repair and replacement
- ✓ On-site system pump-outs
- ✓ Bacterial tests on drinking water wells
- ✓ Community outreach
- ✓ Distribute educational materials through meetings and community contacts
- ✓ Volunteer water quality monitoring
- ✓ Quarterly, Annual and Final Reports
- ✓ Homeowner/ participants will sign septic system maintenance agreements

COOPERATING AGENCIES

- ✓ Missouri Department of Natural Resources – CSI Volunteer Water Quality Monitoring
- ✓ Missouri Department of Conservation
- ✓ Wheaton FFA Stream Team
- ✓ Barry County Health Department
- ✓ Grand Lake O' the Cherokees Watershed Alliance Foundation

CONTACT

Project Manager: Drew Holt
Authorized Representative: Dr. Eugene Miekley
Shoal Creek Watershed Improvement Group
PO Box 6, Pineville, MO 64856
(417) 838 – 1939
HoltDM@missouri.edu

MDNR Project Manager: John Johnson
Subgrant #: G09-NPS-03
Project Period: November 1, 2008 – December 31, 2012
FY05 319 Grant: $29,600
FY07 319 Grant: $195,000
Match: $149,741
Total funding: $224,600

G09-NPS-07

Upper Big River Water Quality Project

HUC 07140104

PROJECT DESCRIPTION

The two main goals of this project are to provide an opportunity, through technical and financial assistance, for landowners in the Upper Big River watershed to improve stream conditions; and create an opportunity to educate landowners and citizens within the watershed about water quality problems in the river and aquifer, sources of impaired water quality, and solutions. These goals will be accomplished through establishing of a steering committee, finalizing the Upper Big River Watershed Management Plan, decommissioning abandoned mineral exploration test holes, building alternative watering systems, fencing out forested areas, establishing riparian forest buffer, preserving and excluding livestock from stream, modeling water quality improvements, calculating pollutant load reductions, and promoting the goals and successes of this project through field days, annual meetings, informational public meetings, presentations, newsletters, publications, other public events, and media outlets.

OBJECTIVES

- Hire staff to complete stated objectives
- Establish steering committee to guide staff
- Finalize the Upper Big River Watershed Management Plan
- Decommission 1300 abandoned mineral exploration test holes within the Big River watershed
- Exclude livestock from the areas around flowing mineral test holes
- Improve timber management through livestock exclusion
- Establish 12 acres of riparian forest buffer/vegetative filter strip along the river
- Preserve and exclude livestock from 4 miles of stream buffers along the river
- Label good demonstrations of best management practices through strategically located signs
- Calculate pollutant load reductions on best management practices
- Develop "before and after" photos of installation of best management practices (BMPs)
- Promote successes of this project through field days, annual meetings, informational public meetings, presentations, newsletters, publications, other public events, and media outlets (e.g., radio)

METHODS EMPLOYED

- Event and meeting agendas, presentations and associated educational materials
- Memorandum of Understanding(s)
- Public outreach materials
- Quarterly submission of data
- Load reductions calculations
- Cost-share and maintenance agreements
- Photo journal
- Media coverage, such as articles
- Quarterly, annual, MBE/WBE, invoice, and final reports, as required

CONTACT

Project Manager: Kenny Gilliam
Authorized Representative: James Plummer, Board Chairman
St. Francois County SWCD
812 Progress Drive, Farmington, MO 63640
(573) 756-6488 x3
kenny.Gilliamr@swcd.mo.gov

MDNR Project Manager: John Johnson
Subgrant #: G09-NPS-07
Project Period: June 1, 2009 – September 30, 2013

FY04 319 Grant	$ 70,000
FY07 319 Grant	$880,000
Match:	$ *
Total funding:	$950,000

* Non-Federal Match will be provided by the Missouri Parks and Soils Sales Tax.

G09-NPS-11

James River Basin Riparian Corridor Restoration and Protection
HUC # 11010002

PROJECT DESCRIPTION

The project is establishing riparian corridors and preserving existing corridors by utilizing conservation easements. A riparian corridor assessment, conducted by the Missouri Department of Conservation (MDC), is being used to identify high quality and poor quality riparian areas that the James River Basin Partnership(JRBP) can target for the easement program. Although the total James River watershed will be addressed, priority and targeted efforts will be given to two subwatersheds, Middle James River and Finley River sub-watersheds.

OBJECTIVES

- Develop and implement a riparian conservation easement program
- Retain 20 miles of riparian corridor systems in the conservation easement program
- Enhance or establish 10 miles of riparian corridor systems in high priority areas
- Create an educational program for riverfront property owners on managing and protecting their corridor systems
- Create a model riparian buffer ordinance and present to city and counties officials within the James River Basin

METHODS EMPLOYED

- ✓ Complete 8 miles of corridor restoration/enhancement implementation
- ✓ Complete 10 miles of corridor preservation
- ✓ Complete 3,500 feet riparian forest buffer
- ✓ Complete 5 acres of stream protection
- ✓ Complete 30 nutrient management plans
- ✓ Complete 20 acres of woodland protection
- ✓ Conduct 8 riparian corridor and stream dynamics workshops
- ✓ Develop a detailed information packet related to conservation easement opportunities
- ✓ Develop a model corridor buffer ordinance
- ✓ Conduct load reduction modeling for preserved or implemented/enhanced corridors
- ✓ Conduct a riparian corridor conservation easement program
- ✓ Develop a riverfront property owners guide for landowners
- ✓ Complete a yearly nonpoint source pollution load reduction report
- ✓ Quarterly Reports, Annual Report, MBE/WBE Report and Final Report

COOPERATING AGENCIES

Missouri Department of Conservation; Greene County SWCD; City and County Planning and Zoning: Christian, Greene, Ozark and Nixa; Watershed Committee of the Ozarks; Table Rock Lake Water Quality Inc.; Upper White River Basin Foundation; NRCS South Missouri Water Quality Project; Finley River Committee.

CONTACT

Project Manager: Joe Pitts
Authorized Representative: Janice Greene, President
James River Basin Partnership
901 S. National, PCOB
Springfield, MO 65897
(417) 836-8878
JoePitts@MissouriState.edu

MDNR Project Manager: John Johnson
Subgrant #: G09-NPS-11;
Project period: May 15, 2009 – July 31, 2015

FY03 319 Grant:	$37,000
FY07 319 Grant:	$263,000
FY11 319 Grant:	$210,000
Match:	$400,020
Total funding:	$910,020

G09-NPS-13 and G11-NPS-15

Missouri Botanical Garden Deer Creek Watershed Initiative Phase I & II

HUC #07140101

PROJECT DESCRIPTION

The watershed initiative is a continuing project currently being conducted by the Missouri Botanical Gardens and other partners. The goal of the initiative is to reduce organic waste pollution in the Deer Creek Watershed, primarily through the implementation of bioretention and other green infrastructure methods. Initiative strategies include work with schools, demonstration projects, data collection, and community outreach.

OBJECTIVES

The main goal of the Missouri Botanical Garden Deer Creek Watershed Initiative project (Phase II) is to reduce impacts in the Deer Creek Watershed by implementing green infrastructure technologies to improve water quality stemming from nonpoint source pollution, with a focus on plant-based solutions.

The project will use various techniques to achieve the overall goal through implementation, demonstration, education, and planning efforts. These techniques will be utilized to achieve the overall objectives:

- Decrease erosion, sedimentation and other nonpoint source pollutants by capturing and infiltrating storm water runoff on-site by utilizing volume-based hydrology approaches.
- Protection of streams and groundwater from chloride.
- Reduce bacteria pollution in the watershed related to animal waste.
- Reduce water pollution caused by yard waste and organic debris.

METHODS EMPLOYED

- ✓ Develop Quality Assurance Project Plan
- ✓ Develop and implement municipal and homeowner cost-share programs
- ✓ Conduct Education/Outreach Programs and host public meetings
- ✓ Development of a nine element watershed management plan
- ✓ Demonstrate Best Management Practices
- ✓ Develop web site, news releases, newsletters, fact sheets and surveys
- ✓ Quarterly, Annual and Final Reports

COOPERATING AGENCIES

- ✓ St. Louis Metropolitan Sewer District
- ✓ Washington University
- ✓ East-West Gateway Council of Governments
- ✓ Soil and Water Conservation District
- ✓ American Society of Civil Engineers
- ✓ Great Rivers Greenway District
- ✓ Missouri Department of Conservation

CONTACT

Project Manager: Deborah Frank, Vice President
Missouri Botanical Gardens
P.O. Box 299
St. Louis, MO 63166
(314) 577-0279
Email: Debora.frank@mobot.org

MDNR Project Manager: Becky Cripe
Subgrant #s: G09-NPS-13/G11-NPS-15
Project Periods: June 1, 2009 – December 31, 2011/
April 1, 2011 – March 31, 2014
FY05/FY08-09 319 grant: $272,011/$706,724
Match: $260,363/$471,957
Total federal funding: $650,829/$1,178,681

G11-NPS-02

Table Rock Lake Area Stormwater Planning and Demonstration Project
Table Rock Lake Water Quality, Inc.

Project Description
The combined Table Rock Lake area watersheds in Missouri are approximately 278,000 acres in size and located in Stone, Barry, and Taney counties. This project will help produce public support in addition to a guidance manual for future watershed and water quality protection efforts, including plans for low-impact development options.

Objectives
1. Promote this planning and demonstration project through a variety of events and through local and digital media.
2. Install at least 26 storm water BMPs with many in highly visible public use areas around Table Rock Lake.
3. Develop a Quality Assurance Project Plan (QAPP) to describe data collection for modeling and mapping.
4. Model nutrient and sediment load reductions using Spreadsheet Tool for Estimating Pollutant Loads (STEPL).
5. Produce an education and guidance/sponsorship program that effectively reaches the local public and creates interest in implementing storm water BMPs.
6. Begin a certificate award program to recognize residents around the lake who implement storm water and other water quality conservation-related BMPs on their property.
7. Develop model ordinances to present to local government.
8. Develop a nine-element WMP for the Lake Taneycomo watershed.

Methods Employed
- ✓ Establish steering committees
- ✓ Conduct regular steering committee meetings
- ✓ Distribute educational materials
- ✓ Maintain website
- ✓ News Releases (8)
- ✓ Quarterly newsletters
- ✓ BMP maintenance agreements
- ✓ Map and design BMPs (26)
- ✓ Bid and assist BMP installation (26)
- ✓ Develop model storm water ordinances
- ✓ Field days to BMP demonstration sites (4)
- ✓ Training workshops (4)
- ✓ Model load reductions with STEPL
- ✓ QAPP
- ✓ Quarterly, Annual, and Final Reports

Cooperating Agencies
Natural Resources Conservation Service
Soil and Water Conservation Districts
University of Missouri Extension
Department of Conservation
Branson Chamber of Commerce
Table Rock Lake Area Chamber of Commerce
Stone County Commission
James River Basin Partnership
Branson Public Works
Ozarks Water Watch
U.S. Army Corps of Engineers
Kimberling City

Contact
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Table Rock Lake Water Quality, Inc.
2 Kissee Ave.; P.O. Box 606
Kimberling City, MO 65686
E-mail: gopala@trlwq.org
Ph: (417) 739-4100
Fax:(417) 739-9889

Project Manager: Amanda Sappington/ Valerie Hentges
Subgrant #: G11-NPS-02
Project Period: 7/15/2011 – 5/31/2015
FY08-09 319 Grant: (Base) $550,600
Match: $368,000
Total funding: $918,600

G11-NPS-03

LOWA LILs for a Healthy Lake of the Ozarks

HUCs # 102901090406 & 102901090407

PROJECT DESCRIPTION

The project is to improve water quality by using watershed friendly landscape techniques. The LOWA Low Impact Landscapes (LILs) management practices that will be used focus on a set of watershed friendly runoff management practices, such as rain gardens, rain barrels, swales, and native plantings, etc.

OBJECTIVES

The overall goal of this project is to implement a subset set of strategies discussed in the Lake of the Ozarks Watershed Alliance (LOWA) watershed management plan for Buck Creek and Lick Branch subwatersheds to reduce nonpoint source loads for nutrients, sediment, bacteria loading utilizing the LOWA LILs approach.

The overall project objectives are:

1. Reduce impairments by decreasing runoff volume through the develop a cost-share incentive
2. Develop educational and outreach programs
3. Promote the LOWA LILs for a Healthy Lake of the Ozarks approach
4. Promoting nutrient reductions: a) making low or phosphorus free fertilizers available to consumers around lake area, and b) encouraging on-site wastewater treatment systems to be up to code
5. Water quality monitoring efforts to document differences in cove types and to compare pre- and post- project efforts

METHODS EMPLOYED

- ✓ Implement aspects of Buck Creek and Lick Branch Watershed Management Plan
- ✓ Series of public workshops and seminars relating to watershed improvements for a healthy lake focus
- ✓ Stakeholder and local government meetings
- ✓ Ordinance development
- ✓ Quality Assurance Project Plan (department accepted)
- ✓ Public Service Announcements, news releases, articles, television and radio interviews promoting project efforts
- ✓ Implementation of storm water management practices
- ✓ Demonstration signs
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

Local retailers (e.g., nurseries, landscapers, contractors, engineering firms), University of Missouri Extension, Ameren Missouri, Camden County Planning and Zoning Commission, Missouri Stream Team Program, Lakes of Missouri Volunteer Program, JLW Web Design, Tan-Tar-A Resort, Scott Concrete, Ozark Rip Rap, Climax Springs One Earth Environmental Club, Gifted Gardens, Sheltered Industry, Ozark Environmental, Schultz & Summers Engineering, Realty Executives – Lake of the Ozarks, Missouri Department of Conservation, Master Gardner's, and citizen volunteers.

CONTACT

Project Manager: Caroline Toole
Lake of the Ozarks Watershed Alliance
P. O. Box 836
Sunrise Beach, MO 65079-0836
(573) 434-4400 or 374-1331
Email address: ckingtoole@yahoo.com

MDNR Project Manager: Becky Cripe
Project Period: January 1, 2011 – December 31, 2014
FY08-09 319 (I) Grant: $740,000
Match: $495,770
Total funding: $1,235,770

G11-NPS-04

South Grand Great Streets Initiative

Green Infrastructure Retrofits for an Urban Environment

East-West Gateway Council of Governments (EWG) HUC #: 071401010506

PROJECT DESCRIPTION

South Grand Boulivard is a major urban roadway (24,000+ vehicles per day) located in the urban environment of the city of St. Louis, Missouri. In partnership with the EWG, the city of St. Louis and the Metropolitan St. Louis Sewer District (MSD), including the South Grand Community Improvement District (CID) will highlight green infrastructure that is effective in urban and suburban areas, and to evaluate specifically its effectiveness to improve water quality of stormwater runoff. Preliminary water quality analysis of the pre-rain garden has been conducted by MSD in 2012.

The project initiated the rain garden implementation process along South Grand Boulevard. Rain gardens will consist of a variety of rain catchment methods for streets; each rain garden will be designed based on the size and conditions of each site. The number of rain gardens able to be implemented are fewer than initially expected due to the existing infrastructure in place. There are several distinct target audiences including the public works and streets department staff of the city of St. Louis, the engineering and planning staff of MSD, as well as transportation engineers in the St. Louis region and state of Missouri, and local government officials in the St. Louis region.

OBJECTIVES

The project will demonstrate green infrastructure, specifically rain gardens, in an urban context, and will seek to remove pollutants from urban runoff that flows to the River des Peres and Mississippi River in order to improve local water quality and reduce gulf hypoxia. Specific objectives of this project include:

1. Reduce pollution entering the River des Peres and Mississippi River from urban runoff;
2. Demonstrate potential of green infrastructure to improve water quality in urban areas;
3. Increase citizen awareness of water quality issues and their role in reducing urban runoff; and
4. Educate government staff and leaders, public works directors and other technical experts about methods to reduce urban runoff and improve water quality.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan
- ✓ 150 days of pre-implementation monitoring
- ✓ Rain gardens implementation and brochure
- ✓ 150 days of post-implementation monitoring
- ✓ Analysis of trends, and data overview supplied annually to DNR
- ✓ Two BioBlitz
- ✓ 1 neighborhood pervious surfaces brochure
- ✓ 4 conference presentations
- ✓ 12 neighborhood association presentations
- ✓ Quarterly, Annual and Final Reports

COOPERATING AGENCIES

Metropolitan St. Louis Sewer District
Missouri Department of Conservation
Southern Illinois University – Edwardsville (SIUE)
South Grand Community Improvement District
City of St. Louis Board of Public Service
Academy of Science St. Louis

CONTACT

Project Manager: David Wilson
East-West Gateway Council of Governments
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St. Louis, MO 63102-2425
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E-mail: david.wilson@ewgateway.org

MDNR Project Manager: Valerie Hentges
Subgrant #: G11-NPS-04
Project Period: January 1, 2011 – December 31, 2014

FY08-09 319 Grant: (Base)	$429,005
Match:	$286,005
Total funding:	$715,010

G11-NPS-06

Springfield/Greene County Urban Watershed Stewardship Project

HUC # 10290106 and 11010002

PROJECT DESCRIPTION

The approach of this project will be to monitor the performance of the selected BMPs at individual site and regional levels in all of the sub-watersheds, as well as estimate pollutant loading improvements at sub-watershed outlets, so that BMP designs and improvements can be incorporated into criteria manuals and future policies and ordinances addressing urban water quality. Lessons learned from this project will be applied to all of the urban and urbanizing watersheds in the Springfield metropolitan area, which is projected to extend to over ninety square miles by 2020.

OBJECTIVES

The primary goal of this project is to improve the quality of runoff and reduce the quantity of runoff leaving the Springfield/Greene County urban area through the implementation of measures to reduce nutrients, bacteria, sediment and runoff volumes in support of the TMDLs and watershed management plans established for the James River and the Little Sac River, the two receiving waters draining the greater Springfield urban area.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan
- ✓ Low Impact Development (LID) techniques and practices
- ✓ Quarterly, Annual, and Final Reports
- ✓ Rain Gardens, pocket wetlands, rain water harvesting, impervious surface disconnection
- ✓ Website, newsletter/newspaper articles, Public Service Announcements
- ✓ Bio-retention, forebays, riparian stabilization/restoration
- ✓ Water quality monitoring at selected sites
- ✓ Analysis of trends, and data overview supplied annually to DNR
- ✓ Presentations

COOPERATING AGENCIES

The City of Springfield/Stormwater Services Division
Greene County/Resource Management Division
Missouri State University
Ozark Greenways
The James River Basin Partnership
Missouri Project WET

CONTACTS

Ms. Stacey Armstrong, Project Manager
Watershed Committee of the Ozarks
320 N. Main Avenue
Springfield, MO 65806
(417) 866-1127, ext. 125
E-mail: Stacey@watershedcommittee.org

MDNR Project Manager: Becky Cripe
Project Period: May 1, 2011 – April 30, 2015

FY08-09 319 (Incremental) Grant:	$1,000,000
Match:	$684,900
Total project cost:	$1,684,900

G11-NPS-07

Dry Branch Watershed: Clear Stormwater & Green Parks

HUC # 07110008

PROJECT DESCRIPTION

This project is evoking change by increasing community awareness of water quality issues by hosting a groundbreaking ceremony, a stream naming contest, public tours of water quality features, developing a web-based tour, and designing and implementing service learning projects. The focus of the project is to demonstrate water quality park enhancements on the 28-acre tract the City, as well as retrofits to stormwater infrastructure on five other properties. The Heartland Park will feature a wetland forebay, bio-filter zones, permeable pavement, native riparian lake buffers, and a wetland and boardwalk with educational signage.

OBJECTIVES

1. To assess and improve water quality in the Dry Branch Watershed, and to make stormwater cleaner and clearer;
2. To beautify parks, subdivisions, municipal and other private property while saving money on maintenance;
3. To show the community better alternatives to fescue, concrete and pipes;
4. To develop a nine-element watershed management plan that identifies nonpoint source pollutants, sources, and prioritizes solutions in year one and two of the project; and
5. To evoke change by increasing community awareness of water quality issues through service learning projects, web-based education, public tours, groundbreaking ceremonies, and water quality-based contests.

METHODS EMPLOYED

- ✓ Quality Assurance Project Plan
- ✓ Electronic copy of raw data submitted to MDNR
- ✓ Quarterly, Annual and Final Reports
- ✓ Watershed Management Plan
- ✓ Water quality monitoring
- ✓ Law Enforcement Center retrofit
- ✓ 2 Commercial stormwater facility retrofits
- ✓ 1 Residential stormwater facility retrofit
- ✓ 1 Wetland forebay
- ✓ Park construction including rain gardens, bioswales, education areas, signage, interpretive trail, pervious pavement, riparian landscape edge, biofilter at athletic fields
- ✓ Data overview supplied annually to DNR
- ✓ Presentations (4)

COOPERATING AGENCIES

- Wentzville Stormwater Advisory Committee
- St. Charles County Soil and Water Conservation District
- Greenway Network, Inc.
- Friends of Wentzville Parks

CONTACT

Project Manager: Jamie Page,
Stormwater Management Coordinator
City of Wentzville
200 East Fourth Street
Wentzville, MO 63385
(636) 639.2030

E-mail: jamie.page@wentzvillemo.org
MDNR Project Manager: Becky Cripe
Project Period: April 15, 2011 – April 14, 2015
FY 08-09 319 (Base) Grant: $748,015
Match: $500,000
Total project cost: $1,248,015

G11-NPS-11

Nonpoint Source Pollution Prevention through Native Plantings in Stormwater Control

Jefferson City Samaritan Center; HUC #: 103001021305

PROJECT DESCRIPTION

The overall goal of this demonstration project is to educate the public on how to decrease the impacts of nonpoint source pollution in an urban setting. To achieve this goal, two rain gardens will be implemented. One rain garden will be near the driveway entrance of the Samaritan Center building to catch sediment and remediate the stormwater flow issues due to the addition of gravel to the overflow parking lot. The second rain garden will be in the field adjacent to the building which is used as a sports practice field for East Elementary School. Additionally, nine rain barrels will be installed at the building downspouts. A secondary goal of the project will be nonpoint source pollution education for the community. A rain barrel workshop will be hosted on-site, as well as, ways to maintain a healthy and environmentally friendly yard. An informational kiosk will be installed for independent learning of the best management practices on the property.

OBJECTIVES

1. To protect and improve water quality in the watershed by implementing two rain gardens & nine rain barrels on-site.
2. Provide Jefferson City residents an example of a low impact type of nonpoint source pollution best management practice using native plants in stormwater control located in a commercial setting.
3. Alleviate the storm water runoff problems experienced by the Samaritan Center.
4. Increase the amount of space available to students at East Elementary School for sports practices by eliminating the permanent wet spot in the practice field.
5. Increase educational awareness of nonpoint source pollution and effective ways for storm water control.

METHODS EMPLOYED

- ✓ 2 rain gardens, minimum 25' x 35', with native plantings and hardwood mulch
- ✓ 9 rain barrels, minimum, attached to building downspouts
- ✓ 1 permanent information kiosk
- ✓ 2 workshop handouts x approx. 100 copies each
- ✓ 12 site tours, minimum - local schools, youth organizations (scouts, 4-H, etc.) will be invited
- ✓ 1 webpage, with project description, information links and survey tool
- ✓ 7 media releases regarding installation
- ✓ 1 ribbon cutting ceremony
- ✓ 1 open house - Samaritan Center clients and volunteers invited to tour site
- ✓ 1 workshop - making rain barrels, maintaining healthy yards
- ✓ Quarterly, Annual and Final Report(s)

COOPERATING AGENCIES

Lincoln University
Jefferson City Eastside Business Association
Cole County Extension
Master Gardeners and other volunteers

CONTACT

Project Manager: Ben DeFeo
Samaritan Center
1310 East McCarty Street
Jefferson City, MO 65101
(573) 634-7776
Email address: bdefeo@midmosamaritan.org

MDNR Project Manager: Valerie Hentges
Subgrant #: G11-NPS-11
Project Period: May 1, 2011 – April 30, 2013
FY08-09 319 Grant: $6,000
Match: $4,000
Total federal funding: $10,000

G11-NPS-12

Hinkson Creek Urban Retrofit Project

Boone County Public Works
Amendment #1

Hinkson Creek is a dynamic stream system, with a drainage area of 90 sq. miles, running southwest through agriculture and pasture land, previous mining land, and urban land. The converted Katy Trail system and Flat Branch park recreational areas provides our residents with a connection to the creek system. Hinkson Creek has been on the 303(d) list since 1998 for unknown toxicity and in October 2009, the Department of Natural Resources drafted a TMDL.

Project Description

The goal of the project is to reduce flooding, improve water quality and health of the aquatic life of Hinkson Creek by implementing monitoring and retrofit activities identified in the Hinkson Creek Watershed Management Plan. A 10-acre city-owned site that currently does not treat storm water runoff will be retrofitted with several storm water BMPs including bioretention or bioswales, underground detention, and pervious pavement. Additionally, an actively eroding channel will be stabilized via installation of a 300 ft-long step-pool storm-conveyance system. A large subdivision was built in the 1980s without storm water controls. To reduce peak flows and flooding, this residential subdivision will be retrofitted with 45 rain gardens/rain barrels, 60 tree plantings, and 3 community storm water treatment features over the 3-year grant period.

Objectives

1. Implement activities that will help achieve the goals of the Hinkson Creek Total Maximum Daily Load, the Hinkson Creek Watershed Management Plan, and protect other streams in Columbia from nonpoint source pollution.
2. Retrofit two areas with storm water BMPs to help reduce NPS pollution and hydrologic load to the receiving streams.
3. Monitor selected BMP performance with respect to pollutants & hydrologic response.
4. Provide BMP performance information to engineers, developers, city construction and maintenance staff, and state and local storm water managers, so they can make informed decisions based on local conditions.

Methods

- ✓ Updated Watershed Management Plan & QAPP (department accepted)
- ✓ Workshops and trainings; Project Meetings
- ✓ Community storm water BMPs
- ✓ Commercial site retrofit BMPs
- ✓ Step-pool Conveyance System (300 linear feet)
- ✓ Rain Gardens and/or Rain Barrels
- ✓ Maintenance Agreements (as needed)
- ✓ Performance data for rain garden BMPs
- ✓ Tree Plantings
- ✓ Educational signs
- ✓ Design Specifications for rain gardens
- ✓ Precipitation and Flow Data
- ✓ Quarterly and Annual Reports; Final Report
- ✓ Monitoring reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports

Cooperating Agencies

Boone County, City of Columbia

Contacts

Project Manager: Nicki Fuemmeler
Authorized Representative: Dan Atwill
Boone County Public Works
801 E. Walnut, Room 315
Columbia, MO 65201
(573) 886-4330
Email address: nfuemmeler@boonecountymo.org

Project Manager: Valerie Hentges
Project Period: March 1, 2011 – April 30, 2014
Subgrant #: G11-NPS-12
Entered in GRTS: FY08-09 #13
Grant Code: 780-0140-4461-3476-W8AD
FY08-09 319 Grant: (Incremental) $713,266
Match: $523,000
Total funding: $1,236,26

G11-NPS-14

Wildcat Glades Education Project

Wildcat Glades Conservation and Audubon Center

Spring River Watershed (11070207) encompasses 1,657,518 acres in southwest Missouri where the HUC 12 watersheds of Shoal Creek (110702070806), Thurman Creek – Shoal Creek (110702070805), and Shawnee Creek – Spring River (11072070901) watersheds lie within Newton County encompassing 20,071 acres and 35,021 acres respectively.

Project Description

Primarily, the project will focus on the education of students and the community to help lead the way to a reduction in nonpoint source (NPS) pollution impairments. Wildcat Glades will create a new two-part NPS-focused educational program with an incorporation of existing water quality related activities such as Stream Team water quality monitoring.

The May 2011, EF5 tornado that caused severe destruction in the watershed and the city of Joplin, in partnering with Wildcat Glades, provides a great educational opportunity to create sustainable and green infrastructure. Additionally, educational opportunities will occur through a rain garden educational demonstration program, focusing on the tornado impact zone.

Objectives

1. Provide local low-income/Title 1 schools NPS-focused educational programs in the 2011/12 through 2013/14 school years.
2. Conduct at least six Stream Team sampling events per year.
3. Compile/distribute one of the quarterly newsletters with a NPS focus annually.
4. Reach at least 100 underserved individuals through a new two-part NPS-focused educational program and water quality monitoring.
5. Develop watershed map/brochure.
6. Implement rain gardens, in conjunction with the NPS educational program with participating schools and other private and public land in the tornado impact zone.
7. Restore a 46 acre of Joplin Creek's riparian corridor leading to water and pollutant infiltration and a buffer for this urban stream.
8. Enhance and restore a wet meadow in the tornado impact zone.
9. Create interpretative and educational signage in all project areas.

Methods Employed

- Watershed Map/Brochure
- News releases/Water Quality newsletters
- Updated web page on water quality
- New NPS-focused educational program
- Stream Team Volunteer Water Quality Monitoring data
- Rain garden educational workshops and cost-share program
- 46 acre restored riparian corridor on Joplin Creek
- Restore and enhance a ¾ acre of a wet meadow
- Interpretive and educational signage
- Quarterly Reports/Annual Reports/Final Report
- Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports

Cooperating Agencies

Joplin R-8 School District Wildcat Glades Stream Team City of Joplin

Contact

Project Manager: Donna Whitehead
Wildcat Glades Conservation and Audubon Center
201 W. Riveria Drive, Suite A
Joplin, MO 64801-5638
(417) 782-6287
Email: dwhitehead@audubon.org

Project Manager: Valerie Hentges
Subgrant #: G11-NPS-14
Project Period: March 15, 2011 to May 31, 2014

FY07 319 Grant:	$454,041
FY08-09 319 Grant:	$174,360
Match:	$418,934
Total project funding:	$1,047,335

G11-NPS-16

Quick Creek Park Environmental Education Project
City of Doniphan

Project Description
The purpose of the Quick Creek Park Environmental Education Project will be to implement conservation practices through restoration and educational efforts at this particular site. The purpose of such an initiative will not only be restoration-oriented, but it will focus upon educational events that in return will facilitate more restoration activities to reduce nonpoint source (NPS) pollution.

Objectives
The restoration activities include:
1) Restoring native vegetation to this site
2) Implementation of rain gardens to demonstrate the effectiveness and ease of managing storm water runoff
3) Writing a lawn nutrient management plan for the athletic fields

The educational activities include:
1) Involving school groups such as the Future Farmers of America (FFA), Science Club and other classes in implementing and managing these restoration sites
2) Constructing outdoor learning classrooms
3) Implementing educational activities for community events such as Earth Day and/or Arbor Day

Methods Employed

- Revegetate approximately 5 acres of disturbed area.
- Plant two demo plots of native grasses and wildflowers.
- Design and construct at least two rain gardens in and around the Quick Creek Park complex.
- Erect educational signs at public rain gardens.
- Write turf nutrient management plans for specified fields.
- Create and distribute educational brochures detailing the issues of nonpoint source pollution.
- Form a Missouri Stream Team for Quick Creek sponsored by a Doniphan School organization.
- Reduce nutrient (phosphorus, nitrogen), bacteria, heavy metals and volatile organic compound inputs into local waterways.

Products
- Lawn nutrient management plan for athletic fields
- Rain Garden
- Outdoor classrooms
- Presentations for local civic groups and other citizens
- Signage for site
- Photo journal and press releases
- Pre-/post-surveys
- Memorandum of Understanding (MOU) between Doniphan and school for on-going maintenance of outdoor classrooms

COOPERATING AGENCIES
Natural Resources Conservation Service
Missouri Department of Natural Resources
University of Missouri-Extension
Ozark Foothills RPC

CONTACT
The City of Doniphan
Connie Teslow, City of Doniphan Clerk
124 West Jefferson St.
Doniphan, MO 63935
donclerk@windstream.net
(573) 996-2623

Project Manager: Jane Davis/Valerie Hentges
Minigrant #: G11-NPS-16
Project Period: 5/1/2011 – 4/30/2013
FY08-09 319 Grant: $10,000
Match: $6,670
Total federal funding: $16,670

G11-NPS-18

Lower Dardenne Creek Watershed Management Plan Project
HUC #07110009

PROJECT DESCRIPTION

This project will develop an Environmental Protection Agency (EPA) 9-element Watershed Management Plan (WMP) for the Lower Dardenne Creek watershed, focusing on Spencer Creek, which is a major tributary to the Dardenne located within the municipal boundary of the city of St. Peters, Missouri. The plan will be developed to help protect and improve water quality in the watershed by identifying pollutant sources, identifying better management practices, setting reachable goals and a timeline for implementation projects, and establishing an evaluation and monitoring program. The Lower Dardenne Creek plan will provide a blueprint for projects and best management practices to address storm water problems, reduce pollutant loading, and improve water quality. The Spencer Creek WMP will be coordinated with a larger storm water management plan to be conducted for all watersheds within St. Peters that flow to Dardenne Creek.

OBJECTIVES

1. Protect and improve water quality in the watershed and Big Creek by identifying pollutant sources and gathering pertinent data.
2. Identify conservation practices to be implemented.
3. Set realistic goals and timeline for implementation.
4. Establish an evaluation and monitoring program to determine success of implemented projects/programs.
5. Increase success of future water quality projects.
6. Help determine where water quality efforts should be focused.
7. Fulfill specific grant application requirements for securing future funding.
8. Provide insight for creation of more efficient implementation and/or education budgets for future projects.

METHODS EMPLOYED

- ✓ Development of a WMP
- ✓ A watershed group will be formed to assist with the watershed planning efforts
- ✓ Schedule and host advisory and stakeholder meetings, and maintain communication with committees, stakeholders, and the public
- ✓ Promote the WMP by using the City's newsletter, local cable TV and website
- ✓ Hire a consultant to conduct water quality monitoring and modeling
- ✓ Public/stakeholders meetings
- ✓ Watershed group collaboration, input and meetings
- ✓ Factsheets, news releases and news articles
- ✓ Local cable TV spots and website information
- ✓ Quarterly, Annual, MBE/WBE, and Final Reports

COOPERATING AGENCIES

CBL and Associates Properties; Great Rivers Greenway District; U.S. Army Corps of Engineers; St. Charles County; the cities of St. Peters, St. Charles, O'Fallon, Dardenne Prairie and Cottleville; and St. Charles County Soil and Water Conservation District.

CONTACT

Project Manager: Russell Batzel
Authorized Representative: William Charnisky
City Administrator
City of St. Peters
One St. Peters Blvd
St. Peters, MO 63376
(636) 477-6600 ext 1304
E-mail: rbatzel@stpetersmo.net

MDNR Project Manager: John Johnson
Watershed Management Plan Grant #: G11-NPS-18
Project Period: July 15, 2011 – September 14, 2014
FY08-09 319 Grant: $30,000
Match: $27,000
Total funding: $57,000

G11-NPS-20

Tower Grove Heights Urban Green Alley Project
(HUC) 071401010506

PROJECT DESCRIPTION

The Tower Grove Heights Urban Green Alley project purpose is to reduce nonpoint source polluted storm water runoff to the urban River des Peres Watershed and Mississippi River from three specific city block alleys by replacing the existing surfaces with permeable pavers. The Tower Grove Heights Project will include local educational efforts to promote community use of BMPs in the Tower Grove Heights neighborhood. Residents will become informed about the use of rain barrels, rain gardens, fertilizer use, and recycling.

OBJECTIVES

- Reduce pollution in urban runoff by installing pervious surfaces and other BMPs that reduce storm water runoff so that it does not negatively affect natural habitats of the River des Peres and the Mississippi River;
- Promote more alley conversions to "green" pervious alleys;
- Provide approved signage at the project site to support educational efforts of the low impact development (LID) pervious paver practices;
- Educate residents on BMPs to reduce quantity and improve quality of storm water runoff; and
- Provide information on proper waste disposal to urban households.

METHODS EMPLOYED

- ✓ Professional design and construction of Green Alleys
- ✓ Conduct sewer laterals repair
- ✓ Map and design production
- ✓ News releases in large circulation newspaper
- ✓ NPS-focused educational program
- ✓ Newsletter with NPS water quality emphasis
- ✓ Interpretive signage at Green Alleys
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise Reports
- ✓ Final Report

COOPERATING PARTNERS

Tower Grove Heights Neighborhood Association
St. Louis Metropolitan Sewer District
Missouri Botanical Garden
East-West Gateway Council of Governments
South Grand Community Improvement District

Contact

Project Manager: Dan Buschmeyer, P.E.
(314) 622-5513
Buschmey@stlouiscity.com
Authorized Representative: Richard T. Bradley, P.E.;
President Board of Public Service
Department of the President, Board of Public Service
City Hall, Room 305
1200 Market Street
St. Louis, MO 63103-2806
(314) 622-4143

MDNR Project Manager: John Johnson
Subgrant #: G11-NPS-20
Project Period: May 1, 2011 – July15, 2014
FY08-09 319 (Base) Grant: $744,000
Match: $496,000
Total funding: $1,240,000

G11-NPS-21

Kiefer Creek Watershed Restoration Project
HUC# 07140102

PROJECT DESCRIPTION
The Kiefer Creek Watershed Restoration Minigrant Project will build organizational capacity within the watershed, develop an educational website and produce a mini-documentary about the history and current state of Kiefer Creek.

The project will begin the process of composing a 9-element watershed plan for Kiefer Creek. A series of stakeholders meetings will be held to analyze data, develop strategies and make final decisions regarding the development of a watershed plan. From the local stakeholders, the people who will comprise the foundation of the watershed coalition will emerge to serve as stewards to the Kiefer Creek Watershed into the near future.

OBJECTIVES
The goal of this project is to build local capacity for the restoration and protection of Kiefer Creek. Capacity building objectives of this minigrant include:
- Form a watershed stakeholder committee that facilitates partnerships,
- Introduce watershed planning to stakeholders at regular meetings,
- Develop a Kiefer Creek website, and
- Create a mini-documentary video about Kiefer Creek and watershed planning.

METHODS EMPLOYED
- ✓ Website
- ✓ Public meetings for WMP development
- ✓ Advisory/Technical Committee meetings
- ✓ Mini-documentary
- ✓ Educational curriculum
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES
Missouri Department of Natural Resources – Castlewood State Park
Missouri Department of Conservation
Metropolitan St. Louis Sewer District
East-West Gateway Council of Governments
Open Space Council
Stream Team Watershed Coalition
St. Louis Audubon Society

CONTACT
Project Manager: Lorin Crandall
Authorized Rep: David Lobbig,
President of the Board
Missouri Coalition for the Environment
6267 Delmar Blvd. Ste 2E
St. Louis, MO 63130
(314) 727-0600
Email address: lcrandall@moenviron.org

MDNR Project Manager: John Johnson
Subgrant #: G11-NPS-21
Project Period: June 1, 2011 – May 31, 2013
FY08-09 319 Grant: $10,000
Match: $7,008
Total funding: $17,008

G11-NPS-22

Stormdrain Marker Program
City of Rolla – Public Works

Project Description
Data indicates several of the streams within Rolla city limits, including Dutro Carter Creek and Burgher Branch, are on the 303(d) list of impaired waterways due to low dissolved oxygen making it apparent that nonpoint source (NPS) pollution has become enough of an issue of concern. This project will be conducted by purchasing and installing 2,000 stainless steel markers on storm sewer structures located in high visibility areas of town. The markers will alert residents that anything dumped into storm drains will impact streams and water quality. The work will be done by a Phelps County Venture Crew #84, local Boy Scout and Girl Scout troops and middle school children and will include training of the participants in fundamentals of non-point source pollution and its prevention. This will be the initial stage of a phased project that will eventually include markers on approximately 4,200 storm structures in Rolla.

Objectives
Project activities are intended to make the public more aware of the role that storm sewer inlets play in the quality of nonpoint source pollution prevention.

1) Volunteer training for installation of storm drain markers.
2) Installation of 2,000 stainless steel markers on storm sewer structures.
3) Conducting a public information campaign including printed materials and media coverage.

Methods Employed

- Install 2,000 stainless steel storm drain markers on storm water collection structures in high visibility areas.
- Outreach through local media outlets and printed materials to raise NPS awareness
- Training of Venture Scouts to properly install the markers and teaching them the fundamentals of NPS pollution and its prevention.

Products

- 2,000 "No Dumping, Drains to Stream" markers installed on storm drain structures
- Photo log of the project
- Pre and post installation survey results
- Media and printed materials emphasizing water quality

Cooperating Agencies
Phelps County Venture Crew #84
Local Girl and Boy Scouts

Contact
Anne McClay, Project Manager
City of Rolla Public Works
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Rolla, MO 65402
amcclay@rollacity.org
(573) 426-6955

Project Manager: Valerie Hentges
Minigrant #: G11-NPS-22
Project Period: 9/10/2011 – 9/9/2013
FY08-09 319 Grant: $10,000
Match: $6,667
Total federal funding: $16,667

G11-NPS-23

Mid-Missouri Water Safety Project (Pharmaceuticals & PCPs)
Columbia Housing Authority Low-Income Services

Project Description
An alarming trend among recent water quality studies is the presence of pharmaceuticals and personal care products found in local water bodies. The purpose of the Mid-Missouri Water Safety Project will be to protect local water bodies by properly disposing of pharmaceuticals and personal care products (pcp's).

Objectives
This project will seek to raise awareness and increase the capacity of Mid-Missouri counties to protect local bodies of water by properly disposing of pharmaceuticals and personal care products.

1) Increase awareness about environmental and community risks associated with the improper disposal of pharmaceuticals and personal care products.
2) Increase awareness about best practices regarding the disposal of pharmaceuticals and personal care products.
3) Increase collaboration among state and local agencies regarding the disposal of pharmaceuticals and personal care products.

Methods Employed
- Increase of the number of educational materials distributed
- Increased participation at take back events
- Pre/Post surveys at the conference
- Participation of new collection sites in a take back event
- Number of new agencies participating/partnership agreements
- Number of "commitment makers" forms collected

Products
- Distribution of 3,500 units of educational materials
- 80,000 pills, liquids, or pcp's collected at the take-back days.
- 6 new collection sites identified in the Mid-Missouri area during the project period.
- 20 new partnerships established.
- 10 new agencies participating in providing pharmaceutical and personal care product disposal events.
- 20 agencies signing on as "commitment makers" to continue education regarding pharmaceuticals and PCPs

Cooperating Agencies
Big Brothers Big Sisters
Boys and Girls Club
Univ. of Missouri Wellness Resource Center
Columbia/Boone County Health Department
Columbia Parks and Recreation Department
Police Departments of Ashland, Hallsville, Centralia, Sturgeon, and University of Missouri
Mediacom
D&H Drug Store
Boone County Sheriff's Department

Contact
Ryan Worley, Project Manager
Columbia Housing Authority – Low Income Services
201 Switzler Street
Columbia, MO 65201
rworley@columbiaha.com
(573) 443-2556

Project Manager: Valerie Hentges
Minigrant #: G11-NPS-23
Project Period: 12/1/2011 – 11/30/2013

FY08-09 319 Grant:	$8,000
Match:	$6,766
Total funding:	$14,766

G12-NPS-01

MU Hinkson Creek Watershed Assessment of BMPs for Water Quality Improvements & Effectiveness
The Curators of the University of Missouri

Project Description
This University of Missouri (MU) led project focuses on the Middle Hinkson Creek and Lower Hinkson Creek hydrologic unit code (HUC) 12 watersheds (HUCs 103001020602 and 603) where MU's campus and the majority of the City of Columbia, MO are located. The project will monitor the performance of a series of best management practices (BMPs) with respect to volume reduction and associated water quality improvements. The BMPs implemented, demonstrated, and evaluated include: bioretention basins for mitigation of nutrients, sediment, *E. coli*, and to reduce first flush volume of stormwater; bio- and grassy swales, e.g., rain gardens, for mitigation of nutrients and sediment and reduction of stormwater flow, including the first flush; detention basin with innovate discharge control structure for reducing the velocity of stormwater flow; and a willow reforestation in a riparian corridor of Hinkson Creek to determining the effects of deep rooted, hydrophilic trees on lowland stormwater volume reduction. Reduction of stormwater velocity and reduced first flush volume of stormwater is the primary focus of the efforts to address the TMDL. Presentations for the planting and maintenance BMP activities will provide education to a project initiated volunteer group, then in-turn be service learning opportunities for these and other student organizations interested.

Objectives
1) Evaluation of the effectiveness of various vegetated BMPs at reducing runoff volumes; BMPs will be instrumented in locations where demonstrations, field days and training can occur with local partners.
2) Placement of a series of BMPs to quantify the compound effects of several practices on achieving improvements to the overall performance of the pollution control system.
3) Initiate educational programs and demonstration field days of a series of vegetated BMPs designed for increased volume reduction.

Methods Employed
- ✓ Quality Assurance Project Plan (QAPP)
- ✓ BMP Workshop/Conference (1 total)
- ✓ BMP educational/interpretative signs
- ✓ Performance summaries/factsheets (at least one for each project site total)
- ✓ Field Day Reports (in conjunction with project partners)
- ✓ Quarterly submittals of the raw water quality data
- ✓ Analysis of trends and data overview supplied annually to DNR (including load reductions)
- ✓ Data submission/acceptance to MoWIN and International BMP Database
- ✓ Quarterly, Annual, and Final Report(s)

Cooperating Agencies
Boone County
University of Missouri Extension – Water Quality
City of Columbia

Contact
Project Manager: Dr. Enos C. Inniss
University of Missouri – Columbia
Civil & Environmental Engineering
E2509 Lafferre Hall
Columbia, MO 65211
(573) 882-2041
Email address: innisse@missouri.edu

Project Manager: Valerie Hentges
Subgrant #: G12-NPS-01
Project Period: April 1, 2012 – March 31, 2014
FY10 319 Grant: (I) $253,800
Match: $169,267
Total funding: $423,067

G12-NPS-02

Asher Creek 319 Project

HUC # 10290106

PROJECT DESCRIPTION

The purpose of the Asher Creek 319 Project is to implement the Little Sac River Watershed Management Plan (WMP). The conservation practices planned for the project (prescribed grazing systems, soil testing and pH correction to increase nutrient uptake, and riparian corridor exclusion) will reduce the nutrients and fecal coliform bacteria entering Asher Creek and the Little Sac River watershed. The project, through the Greene County Soil Water Conservation District (SWCD), is overseeing construction of prescribed grazing systems, riparian corridor exclusion, pH correction incentive programs, and water quality monitoring.

PROJECT GOALS

The main goals of this project are:

1. To begin addressing the critical resources issues identified by the stakeholder committee in the WMP. By selecting a small highly focused area to begin best management practice (BMP) implementation, it is hoped that the work can be completed and documented in the short time given for the project.
2. To further define the levels of impairment in the watershed through weekly monitoring of E. coli, Total Phosphorus (TP), Total Nitrogen (TN) and Optical Brighteners.
3. To educate area producers on the benefits of the project's BMPs and to help them understand the effects those BMPs can have on the watershed on a larger scale.

COOPERATING AGENCIES

- USDA Natural Resources Conservation Service
- Polk County SWCD
- Watershed Committee of the Ozarks (WCO)
- Ozarks Environmental Water Resources Institute (OEWRI)

METHODS EMPLOYED

- ✓ Memorandum of Understanding (MOU) with MSU-OEWRI for water quality sample analysis/ load duration method development
- ✓ MOU with WCO for water quality sample collection
- ✓ Develop contracts with landowners for project BMPs
- ✓ 3 prescribed grazing systems
- ✓ 5 acres of riparian corridor exclusion
- ✓ Quality Assurance Project Plan
- ✓ Soil testing and pH correction – 500 acres
- ✓ 2 field day events
- ✓ Water quality monitoring - 2 years, 6 sites, 1165 total samples
- ✓ Newsletter articles related to this 319 project
- ✓ Quarterly/Annual/MBE-WBE reports to DNR
- ✓ Final Report

CONTACTS

Project Manager: Mr. Will Rhodes
Greene County Soil and Water Conservation District
688 S. State Hwy B, Ste. 200
Springfield, MO 65802
(417) 831-5246, ext. 3
E-mail: will.rhodes@swcd.mo.gov

MDNR Project Manager: Becky Cripe
Project Period: February 1, 2012 – January 31, 2014

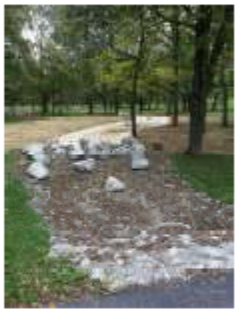
FY10 319 (Incremental) Grant:	$134,186
Match:	-0-
Total project cost:	$134,186

G12 -NPS-03

The Middle and Upper James River Show-Me Yards, Neighborhoods, Farms and Ranches

HUC # 11010002

PROJECT DESCRIPTION



This project expands the Show-Me Yards and Neighborhoods (SMY&N) program to include rural, agricultural, and suburban areas within the James River Basin with an initial focus on the Pearson Creek Watershed (PCW) to include small farms and ranches of 300 acres or less. The expanded Show-Me Yards, Neighborhoods, Farms & Ranches (SMYNFR) program will be co-sponsored by James River Basin Partnership (JRBP) and the city of Springfield.

OBJECTIVES

The overall goals of this project are to (1) increase citizen and local government knowledge and participation; and (2) reduce the amount of nutrient loading in the PCW. The overall goal of the project will be achieved through the following objectives.

1. Expand the successful SMY&N Program into the PCW to include small farms and ranches by using existing and/or developing new workshop and training formats.
2. Provide a variety of cost-share incentives throughout the PCW focusing on riparian owners where possible and as owner interest dictates.
3. Review historical water quality data and obtain new water quality data to detect water quality improvements resulting from project efforts.
4. Market and promote project efforts to maximize participation in training and cost-share incentive programs.

METHODS EMPLOYED

- ✓ Protection or establishment of 1200 linear feet of riparian forest buffer
- ✓ Installation of two stream protection best management practices (BMPs) from the tool box of practices
- ✓ 25 soil tests
- ✓ 25 4-year Nutrient Management Plans (NMP)
- ✓ 1 cistern demonstration project or any combination of 10 low impact development (LID) practices
- ✓ 200 on-site wastewater treatment system (OWTS) cost share pump-outs (Pending DNR approval of additional funding request)
- ✓ 2 training workshops for home and small farm owners
- ✓ 2 training workshops for developers and lawn care professionals
- ✓ 1 satellite SMYNFR program in a community located in the James River Basin
- ✓ 1 model homeowners association covenant
- ✓ 32 updates in the JRBP and city of Springfield quarterly and monthly newsletters
- ✓ A suite of revised SMYNFR brochures for distribution
- ✓ A SMYNFR page on the JRBP and city of Springfield web sites
- ✓ A webcast to explain the SMYNFR program to potential satellite sponsors
- ✓ An approved Quality Assurance Project Plan (QAPP)
- ✓ A series of 4 news releases over the life of the project
- ✓ 2 Public Service Announcements (PSAs) about the availability of the program
- ✓ 8 quarterly reports to DNR
- ✓ 1 final report to DNR

COOPERATING AGENCIES

- City of Springfield
- Greene County Stormwater Management
- University of Missouri Extension
- Missouri State University (MSU)
- Ozarks Environmental and Water Resources Institute (OEWRI)
- Natural Resources Conservation Service
- Missouri Department of Conservation
- Greene County Soil and Water Conservation District
- Watershed Committee of the Ozarks

CONTACT

Project Manager: Melissa Bettes
James River Basin Partnership
Park Central Office Building
901 South National
Springfield, MO 65897
Email address: melissabettes@missouristate.edu

MDNR Project Manager: Becky Cripe
Project Period: March 1, 2012 – February 28, 2014

FY10 (I) 319 Grant:	$293,506
Match:	$195,729
Total federal funding:	$489,235

G12-NPS-04

Spring River Watershed Management Plan Implementation Project
HUC #11010010

PROJECT DESCRIPTION

The Spring River Watershed Management Plan Implementation project is being implemented in southwest Missouri, in and around the city of Carthage in Jasper County. This area of Spring River is approximately 38.73 square miles and has been noted as impaired due to high levels of bacteria (*E. coli*). The project starts the implementation of the Spring River Watershed Management Plan, in which the primary objective is to reduce bacterial levels to below the whole body contact level for recreational waters. As proposed in the plan, the project will implement best management practices (BMPs), targeted in areas of possible sources of bacteria pollution occurring from human, agriculture production and livestock operations.

OBJECTIVES

- Implement agricultural and stormwater best management practices (BMPs)
- Develop educational outreach projects that increased local landowners knowledge of cost-share programs
- Educate local landowners about the benefits of implementing BMPs to protect water quality.
- Host several public landowners meetings to discuss BMPs programs and installation
- Educate the local youth and future farmers about new methods of water quality protection.
- Provide modeling and monitoring of BMPs throughout the entire watershed.

METHODS EMPLOYED

- ✓ Conduct storm water drain stenciling
- ✓ Implement urban rain garden and rain barrel demonstrations and field days
- ✓ Install on-site septic systems and remediation cost-share practices
- ✓ Conduct Stream Team monitoring activities
- ✓ Implement yearly water festivals
- ✓ Hold public meetings
- ✓ Install riparian BMP cost-share practices
- ✓ Conduct load reduction modeling for preserved or enhanced riparian corridors
- ✓ Conduct water quality monitoring and reporting
- ✓ Yearly nonpoint source pollution load reduction reporting
- ✓ Quarterly Reports, Annual Report and Final Report
- ✓ Install project signs on demonstration sites

COOPERATING AGENCIES

University of Missouri Extension, Jasper County Health Department (JCHD), Jasper-Newton Environmental Taskforce, Jasper County SWC, Missouri Department of Natural Resources, NRCS, Southwest Ozarks Stream Teams, city of Carthage, Missouri Department of Conservation, and Jasper County Watershed Partnership

CONTACT

Project Manager: Tony Moehr,
JCHD Administrator
Authorized Representative: Jim Honey,
Eastern District Commissioner
Jasper County Commission
105 Lincoln, Carthage, MO 64836
(417) 358-0480
moehra@lpha.mopublic.org

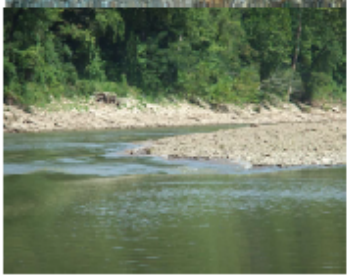
MDNR Project Manager: John Johnson
Grant #: G12-NPS-04
Project Period: April 15, 2012 – April 14, 2014
FY08-09 319 Grant: $331,068
Match: $197, 679 *
Total funding: $553,740

*Remaining $25,000 match is provided through funds generated from the Missouri Parks and Soils Sales Tax

G12-NPS-07

Keifer Creek Watershed Management Plan (WMP)
HUC# 07140102

PROJECT DESCRIPTION
This project will develop a Watershed Management Plan (WMP) for the Keifer Creek sub-watershed, located in southwestern St. Louis County. To develop the watershed plan, the Missouri Coalition for the Environment will use a planning process that encourages local stakeholder participation and support. This process will involve multiple steps and technical expertise to address all nine critical elements involved in the planning process.



OBJECTIVES
The overall goal of the Keifer Creek WMP is to understand the quantity and location of pollution sources; to determine a pollution loading reduction goal that can be achieved by nonpoint source management measures; to develop an implementation plan to achieve the pollution loading reduction goal; to propose a plan to monitor water quality during and after prospective implementation of nonpoint source management measures; to craft a strategy for funding the proposed implementation plan, and to achieve all of this through a planning process that engages community members, partners and stakeholders.

METHODS EMPLOYED
- ✓ Use a planning process that encourages local stakeholder participation and support.
- ✓ Stakeholder public meetings will be held to identify watershed problems, major pollutant sources, and management measures to be implemented.
- ✓ Draft watershed management plan will be presented to both technical and advisory committees and the general public before finalizing.
- ✓ WMP planning committee will meet on a regular basis to review data.
- ✓ Project Manager will oversee the project, providing oversight and organizing technical expertise where needed.
- ✓ Compile and evaluate existing water quality and flow data.
- ✓ Review existing water quality management studies.
- ✓ A stakeholder committee will be formed that is comprised of a wide variety of interested groups within the watershed that includes concerned citizens, business people, conservation agencies and organizations, community service groups, and city and county governments.
- ✓ Quarterly, Annual, MBE/WBE, and Final Reports and invoices.
- ✓ Website, newsletter/newspaper articles, Public Service Announcements.
- ✓ Presentations to interested public/private/governmental entities.

COOPERATING AGENCIES
Missouri Department of Conservation
Missouri Department of Natural Resources
Metropolitan St. Louis Sewer District
East-West Gateway Council of Governments
St. Louis University
Washington University
Local municipalities
Webster University

CONTACT
Project Manager: Lorin Crandall
Authorized Representative: Kathleen Logan Smith
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E-mail: Lorincrandall@gmail.com

MDNR Project Manager: John Johnson
Subgrant #: G12-NPS-07
Project Period: July 1, 2012 - November 30, 2014
FY08-09 319 (Base) Grant: $10,000
Match: $20,004
Total funding: $50,004

G 12 -NPS-08

Black Creek Watershed Management Plan
(HUC ##071100050201 & -02)

Project Description
The overall goal of the watershed management plan (WMP) is to take a holistic approach to improving water quality by reducing pollutant runoff entering the Black Creek Watershed. The plan itself will describe various strategies/objectives to achieve the overall goal. Because of the proposed 2012 303(d) impaired listing, the Northeast Missouri Resource Conservation & Development Council, Inc (RC&D) will coordinate development of a stakeholder driven WMP for the (upper and lower) Black Creek Watersheds, addressing the nine (9) critical elements of a watershed management plan as identified by the Environmental Protection Agency (EPA).

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Objectives

- ★ Form a diverse watershed planning steering committee, consisting of local and state agencies, residents, and landowners.
- ★ Conduct watershed meetings to increase public knowledge, encourage participation, and gather citizen concerns ;
- ★ Conduct watershed assessment and research available watershed data to determine past, current and future efforts, and assessment gaps;
- ★ Estimate current pollutant loads and reductions utilizing a simplified watershed model (e.g., STEPL); and determine management practices needed to achieve load reduction goals; and
- ★ Promote project efforts through various media outputs and other activities.

Methods Employed

- ✓ Department Accepted Watershed Management Plan
- ✓ Series of public meetings for WMP development
- ✓ PSAs, newsletter, e-mails, blogs, news releases
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Final Report
- ✓ Watershed Planning Committee meetings
- ✓ Education and Outreach workshops

Cooperating Agencies
University of Missouri Extension, Regional University of Missouri Extension, Shelby County Soil and Water Conservation District.

Contact

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Darla Campbell (RC&D)
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319 Project Manager: John Johnson
Subgrant #: G12 -NPS-08
Project Period: March 1, 2012 - February 28, 2014
FY08-09 319 Grant: $30,000
Match: $ -0-
Total federal funding: $30,000

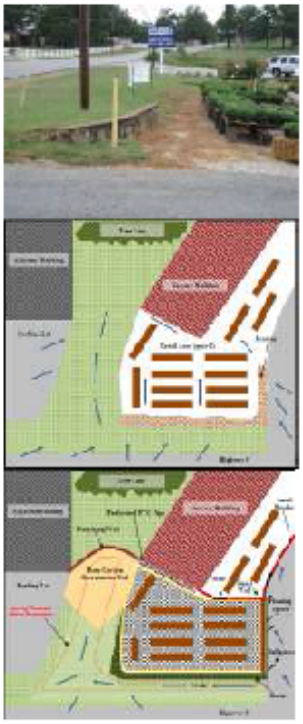
G12-NPS-10

The Gifted Rain Garden Implementation and Educational Project

HUC # 10290110

PROJECT DESCRIPTION

The Gifted Gardens Facility plans to demonstrate bioretention methods to mitigate nonpoint source runoff. The location of the facility provides an excellent site for demonstrating stormwater management techniques while addressing nonpoint source pollution at the Lake of the Ozarks.



OBJECTIVES

The overall goal of the project is to:

- Implement and demonstrate a variety of management practices (e.g., swales, rain gardens, native plantings, vegetative check dams) on the Gifted Garden site to mitigate nonpoint source runoff, with an option of implementing a second rain garden demonstration site at a separate business location.
- Educate local citizens regarding the applicability and effectiveness of such treatment systems by promoting and implementing educational workshops for the community.
- Provide staff training and create an opportunity to create a part-time position for a person with disabilities.

METHODS EMPLOYED

- ✓ Conduct 3 educational workshops
- ✓ Design & implement 1 bioswale, 2 rain gardens
- ✓ Train 2 staff on rain garden design, implementation, and plant selection techniques
- ✓ Provide 1 person with disabilities with part-time work
- ✓ Print and distribute 500 rain garden informational brochures
- ✓ Administer pre/post surveys
- ✓ Develop newsletter and newspaper articles
- ✓ Educational signs
- ✓ Quarterly Reports
- ✓ Annual Reports
- ✓ Minority Business Enterprise/Women Business Enterprise (MBE/WBE) Reports
- ✓ Final Report

COOPERATING AGENCIES

Ameren Missouri, Natural Resources Conservation Service, Lake Area Master Gardeners, Missouri Department of Conservation

CONTACT

Project Manager: Tiffany Riemann
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MDNR Project Manager: Becky Cripe
Project Period: May 1, 2012 – April 30, 2014

FY08-09 319 (B) Grant:	$10,000
Match:	$6,700
Total funding:	$16,700

G12-NPS-13

Branson Storm Drain Marking Project to Reduce Nonpoint Source Pollution

HUC # 11010003

PROJECT DESCRIPTION

The Branson Storm Drain Marking project will install 600 stainless steel markers on storm drains in the highly visible Branson Landing area in the Branson Missouri. The project goal is to raise awareness of the importance of preventing nonpoint source pollution and educate citizens on how their daily activities can has an impact on water quality in their community and Lake Taneycomo. The city will provide GIS training to a local intern so a database can be developed to map and track the marker program progress. Public awareness of alternative measures to prevent nonpoint source pollution will be raised through media coverage in multiple outlets including television, radio and newspaper interviews. A web page will also be developed to inform citizens about the storm drain program and provide water quality information for the general public use.

OBJECTIVES

- Acquire and input GIS data on additional 600 storm drains. Intern trained and supervised by the city GIS/Mapping Coordinator.
- 20% of the city's storm drain system currently mapped (871 inlets). An additional 20% of system will be added to GIS database using interns.
- Generate city map of which storm drains are currently in GIS database, including which have been marked with decal.
- Inform community of storm drain decals purpose and links to nonpoint source pollution (2 radio interviews, 2 news releases, 2 news articles).
- Provide opportunity for at least 50 or more citizen to participate in storm drain decal project. Install 600 storm drain decals.
- Create webpage on city of Branson website detailing use of storm drain markers and informing of nonpoint source pollution.

METHODS EMPLOYED

- ✓ Generate public awareness of alternatives to prevent nonpoint source through media coverage in multiple outlets
- ✓ Install 600 storm drains markers
- ✓ Distribute door hang tags throughout the project area with a phone number for questions
- ✓ Develop a notebook documenting project planning, budget, activities and supplies
- ✓ Create a nonpoint source pollution/stormwater web page on city of Branson website
- ✓ Develop GIS database and a map to track the storm drain marking project progress
- ✓ Conduct 2 radio interviews
- ✓ Develop 2 news releases and 2 news articles
- ✓ A photo journal will be kept as part of the reporting, evaluation and website updates

COOPERATING AGENCIES

City of Branson, Boy Scouts, Table Rock Lake Water Quality Inc., Girl Scouts Troop, James River Basin Partnership, and Branson Landing area communities

CONTACT

Project Manager: Mona Menezes
Authorized Representative: David Miller
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MDNR Project Manager: John Johnson
Minigrant #: G12-NPS-13
Project Period: May 1, 2012 – October 31, 2014

FY08-09 319 Grant:	$3,819
Match:	$2,546
Total funding:	$6,365

G12-NPS-14

Pride of Stride
HUC #07110002

PROJECT DESCRIPTION

The "Pride of Stride" project in Scotland County will aid in addressing water quality problems on the Scotland R-1 school ground, increase awareness and knowledge of environmental issues and teach about native plants that can be used to mitigate nonpoint source pollutants. The project will design and implement best management practices (BMPs) to address the gully and erosion problems along the trail and school ground areas. The BMPs will be used as a demonstration to educate students and the local community about nonpoint source erosion.

OBJECTIVES

1. Reduce soil erosion by using rip rap, tile and gravel to stop gully and most of the rill erosion in the highly visible area of the community and school grounds before it enters Guinn's Branch.
2. Use the BMP demonstration site as an outdoor classroom for 50 students.
3. Implement classroom lessons on watershed and BMPs to one Vocational Agriculture class.
4. Build awareness in Scotland County of the relationship between nonpoint source pollution and BMPs.
5. Increase walking traffic to the demonstration site and walking trail by 20%.

METHODS EMPLOYED

- ✓ Design and implement BMPs to address the gully and rill erosion problems
- ✓ Use geotextile fabric to tier and gravel the existing drainage ditch by dry hole structure
- ✓ Tile areas between the playground and riparian area to stop the washing from parking lot runoff
- ✓ Use geotextile along walking trail at sediment basin to prevent erosion
- ✓ Use native plant species around the edge of the sediment basin, to filter pollutants
- ✓ Use RUSLE2 to calculate gully erosion and determine soil loss
- ✓ Demonstration signage will be developed and placed in visible locations on the project site
- ✓ Develop and distribute teaching curriculum for two Vocational Agriculture and Science teachers.
- ✓ Increase communities awareness of nonpoint source pollution through newsletter and radio releases
- ✓ Implement pre- and post-survey
- ✓ Complete visual site assessment with pre- and post-pictures of the project site
- ✓ Use pre- and post-tabulation (counter method) to determine the percentage increase in traffic at site.

COOPERATING AGENCIES

Missouri Department of Natural Resources, University of Missouri Extension, Natural Resources Conservation Service, Missouri Department of Conservation, Scotland R-1 School, Tiger Team Trail Committee, Fabius Master Gardeners, Scotland County Commission, Scotland County Soil and Water Conservation District (SWCD)

PROJECT SPONSOR

Project Manager: Darla Campbell
University Missouri Extension
Authorized Representative: Duane Elbeling
Board Chairman
Scotland County SWCD
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MDNR Project Manager: John Johnson
Minigrant #: G12-NPS-14
Project Period: April 15, 2012 – April 14, 2014

FY08-09 319 Grant:	$10,000
Match:	$6,667
Total funding:	$16,667